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ABSTRACT

This report provides a technical-level analysis, discussion, and summary of five experiments in applied behavior analysis. Experiment 1 examined the token economy as a basis for motivating inmate behavior; Experiment 2 examined the relationship between magnitude of token reinforcement and level of inmate performance; Experiment 3 introduced a 'License Procedure' to determine its effect on inmate participation in a leisure-time education program; Experiment 4 compared three formats for presenting programmed instruction material; and Experiment 5 examined the effectiveness of decreasing undesirable behavior by reinforcing incompatible opposites. All experiments were carried out at Draper Correctional Center, Elmore, Alabama, with a population of incarcerated, young adult felons. The report provides ample data in discussion of the results of experiments, and it includes a general discussion of the role of applied behavior analysis in the field of corrections. A relevant bibliography is also included. (Author)

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APPLIED BEHAVIOR ANALYSIS AND THE IMPRISONED ADULT FELON
PROJECT I: THE CELLBLOCK TOKEN ECONOMY

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16. Abstracts

This report provides a technical-level analysis, discussion, and summary of five experiments in applied behavior analysis. Experiment 1 examined the token economy as a basis for motivating inmate behavior; Experiment 2 examined the relationship between magnitude of token reinforcement and level of inmate performance; Experiment 3 introduced a 'License Procedure' to determine its effect upon inmate participation in a leisure-time education program; Experiment 4 compared three formats for presenting programmed instruction material; and Experiment 5 examined the effectiveness of decreasing undesirable behavior by reinforcing incompatible opposites. All experiments were carried out at Draper Correctional Center, Elmore, Alabama, with a population of incarcerated, young adult felons.

The report provides ample data in discussion of the results of experiments, and it includes a general discussion of the role of applied behavior analysis in the field of corrections. A relevant bibliography is also included.

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The project reported herein operated between November, 1970, and February, 1972. This report is submitted to Howard Rosen, Director of the Office of Research and Development, and to William Throckmorton, Project Officer, by John M. McKee, Director of the Experimental Manpower Laboratory for Corrections, Rehabilitation Research Foundation, P. O. Box 3587, Montgomery, Alabama, 36109.

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Preface

This report represents a compilation of a number of papers that have been previously read at a variety of professional meetings. Portions of the introduction and the earlier phases of Experiment 1 were presented at the 1971 meeting of the Southeastern Psychological Association (Milan & McKee, 1971). The whole of Experiment 1 and Experiment 2 formed the basis of a paper read at the Southeastern Psychological Association meeting in 1972 (Milan, Hampton, Murphy, Rogers, Williams, & Wood, 1972). Experiment 3 was discussed at the annual convention of the American Personnel and Guidance Association (Milan, 1972). Finally, the research reported in Experiment 4 was presented at the 1971 meetings of both the American Psychological Association (Milan & Wood, 1971) and the Southeastern Psychological Association (Wood & Jenkins, 1971).

It is a pleasure to acknowledge the contribution of the many people who made this project possible. The cooperation of the administration and staff of the Alabama Board of Corrections in general and, particularly, that of General William Fondren, John Watkins, and G. Wayne Booker, who, respectively, served as commissioner of corrections and warden and classification officer of Draper Correctional Center during the period of this project, deserve special mention, for they not only made the project a feasible endeavor but they also contributed much to its daily operation. Correctional Officer W. O. Brown, who worked closely with the project staff throughout the project, also provided valued assistance. Ronald Akers, Nathan Azrin, Harold Cohen, Kim Nelson, and Montrose Wolf visited the Experimental Manpower Laboratory for Corrections early in the project and provided valuable comments that helped shape the form of the token economy and the topics investigated. In addition, the support of Ronald Harrington of Troy State University and the assistance of his students, John Wright and Michael Murphy, who did their practicums with the Laboratory, are sincerely appreciated. The careful editorial work of Charles Petko in the preparation of this report is gratefully acknowledged, as are the contributions of our MT/ST operator, Eloise White, and our artist, John Hooks.

The U. S. Department of Labor, in the persons of our project officer, William Throckmorton, and the associate directors of the Office of Research and Development, Howard Rosen and Seymour Brandwein, is due a special note of appreciation for its support of the project and for its perception of the project within the broad perspective of the manpower mission of their agency. Finally, the correctional officers and the inmates of

Draper Correctional Center deserve particular recognition. Both groups of men made special efforts to cooperate with the project staff, and, by so doing, they made valuable contributions to this demonstration of the potential contribution of applied behavior analysis to the criminal justice system.

INTRODUCTION

Conflicting Roles of Corrections

Recent years have brought increased public concern about what appears to be a steadily rising crime rate and an apparent inability of the existing legal, judicial, and penal procedures to serve as either deterrents to or modifiers of criminal behavior. From this concern has come a widespread demand for reform of the criminal justice system and an intensive search for effective crime control procedures. Although professional criminologists may not agree about the specific changes that must be made, most do agree that the criminal justice system itself requires thorough examination and overhaul; that the scope of its efforts is too narrow and requires careful expansion; and that the services it provides are, at best, of marginal quality and require redirection and improvement. Moreover, it appears that corrections, long neglected by both the public and the professional community, demands the closest examination; and its policies, procedures, and mission require almost complete revision.

A major obstacle to examining and improving correctional efforts is the marked lack of agreement within both the criminal justice system itself and the public at large concerning what the roles and objectives of corrections in society are and how they may be best realized. This is not a new phenomenon. Criminologists have long recognized the problem of disagreement and its effect on program planning, funding, and implementation:

> ...our modern prison system is proceeding on a rather uncertain course because its administration is necessarily a series of compromises. On the one hand, prisons are expected to punish; on the other they are supposed to reform. They are expected to discipline rigorously at the same time they teach self-reliance. (Federal Bureau of Prisons, 1948, p.3)

For some, prisons exist to deter potential offenders from committing criminal acts and to mete out retribution to those whom they fail to deter. Others advocate imprisonment as a means of protecting the members of society from those who would do them harm. Still others look to the period of imprisonment as the last hope society has of rehabilitating convicted offenders so that they may find a satisfying and productive place in the community. These conflicting views will not be resolved easily, for each contains sufficient truth to ensure its continued advocacy and sufficient error to ensure its continued opposition. The threat of imprisonment undoubtedly does deter some from engaging in criminal acts, if only under certain conditions, such as in the presence of

a police officer; confinement does indeed protect society from the offender, if only for the period of confinement; and the services provided within correctional institutions most probably do rehabilitate some offenders, if only the smallest of minorities. However, the present crime rate demonstrates that far from all potential offenders are effectively deterred by the threat of imprisonment as it is now brought to bear in our society. Additionally, confinement permanently protects the public from only the most dangerous, for more than 95% of those who have been imprisoned eventually return to the community. Finally, most would agree that the hope that prisons will rehabilitate a significant portion of those whom they serve is far from being fulfilled. Recidivism figures indicate that between one- and two-thirds of those who have been imprisoned and released will soon be imprisoned again.

It should not be surprising, therefore, that the confusion surrounding the role of corrections in society and the inadequacies of the criminal justice system in general have prompted a variety of contradictory and oftentimes incompatible recommendations from members of both the professional community and the concerned citizenry. Some urge a greater emphasis upon the apprehension and conviction of the offender (Murphy, 1972); others demand long prison sentences and harsh conditions of imprisonment (Hoover, 1970); and still others argue for more humane treatment of the imprisoned offender (Menninger, 1968) and a greater emphasis upon rehabilitation through psychotherapy, education, and vocational training (Clark, 1969). A small but growing minority have despaired of corrections' potential and now advocate the abolition of all correctional institutions and the release of those who are currently imprisoned (Mitford, 1973).

The National Advisory Commission on Criminal Justice Standards and Goals (1973), acknowledging claims that the American correctional system today appears to offer minimum protection for the public and maximum harm to the offender, has attempted to temper and reconcile these disparate views. Among its many recommendations are: (1) that a greater emphasis be placed on community efforts that prevent crime and aid the released offender in readjusting to community life; (2) that corrections adopt a maximum sentence of five years for all offenders, with no statutorily imposed minimum, except for those identified as persistent violators, professional criminals, or dangerous offenders, who would be eligible for sentences ranging up to twenty-five years; and (3) that there be a ten-year moratorium on the construction of state institutions for adults, except when total system planning shows that the need for them is imperative.

The degree to which the commission has qualified its recommendations and implied the continuation of the traditional correctional apparatus reveals the extent to which prisons are and will continue to be a fact of life in American society for the foreseeable future. Considerations such as these gave rise to the following five assumptions, which guided the research endeavor described within this report:

1. Correctional centers, for the foreseeable future, will continue to exist, and men and women will continue to be confined within them.
2. A greater effort must be made to insure that those who are imprisoned will return to the community no worse for their experiences.
3. A greater effort must be made to offer imprisoned offenders a full range of programs that have the potential of preparing them to lead more satisfying and productive lives than were available to them prior to their imprisonment.
4. A greater effort must be made to encourage imprisoned offenders to avail themselves of the programs offered in correctional centers.
5. Such efforts will in no manner impede and will, most probably, hasten the reforms in correctional thought and practice urged by both the professional community and the concerned citizenry.

Shortcomings of the Punishment Model

The manner in which these assumptions are to be acted upon is less clear than the considerations that have given rise to them. The criminal justice system's new emphasis on accountability has revealed that its cherished beliefs are of questionable validity and that the intervention programs deduced from those beliefs are of little utility. Athough disappointing, it should not be surprising that institutional and community correctional programs have had little, if any, effect upon recidivism (Crowther, 1969; Glaser, 1964; Lerman, 1970). There is nothing inherent in pretrial diversionary procedures, probation, adult basic education, vocational training, graduated release, parole, etc., that should lead one to expect that they alone will serve to rehabilitate the offender. If they are to contribute to the solution of the problem of crime in America, they can serve best as vehicles for the systematic application of procedures designed specifically to effect change in the behavior of the offender.

To date, however, the characteristic treatment philosophy of the criminal justice system has been one which stresses both the threat of punishment to suppress unwanted

behavior and the use of aversive control in the form of escape and avoidance procedures to motivate the performance of desired activities. Although these techniques are employed to a greater or lesser degree throughout the criminal justice system, it is in corrections itself that they are most extensively deployed, and it is here that the debilitating effects of this philosophy are most clearly evident (Durkheim, 1947; Glaser, 1971; Milan & McKee, 1974). Even those inmates who are fortunate enough to begin participation in a rehabilitation program immediately upon their admission to the institution soon come under the influence of this form of coercive control and the inmate subculture it breeds. Those who are at first friendly and outgoing turn hostile and sullen. Those who would normally return misplaced items come to steal them instead. And those who are eager to learn in the academic and trade areas lose interest and malinger. It is apparent that the acknowledged failure of correctional institutions to rehabilitate is due as much, or more, to what is "taught" the inmate in his free time in the institution than to the academic and vocational deficiencies he carries with him when he returns to the community. It is as if the prison itself, with both its social system and its emphasis on obedience, passivity, and punitively oriented control procedures, is a well-designed "teaching machine" (Buehler, Patterson, & Furniss, 1966) that sets the occasion for, instructs, models, shapes, prompts, and reinforces lack of initiative, resistance, and adherence to the inmate subculture.

Although the punishment and aversive control procedures employed to maintain order and manage inmate behavior in virtually all correctional institutions do effectively control behavior, their side effects undoubtedly contribute to the unrest in our prisons and increase, rather than decrease, the likelihood that the released offender will commit additional crimes. Recent experimental investigations of the effects of punishment upon behavior (Azrin & Holz, 1966) indicate that it produces a number of by-products that, if extrapolated to the punishment procedures practiced in penal institutions, argue against its desirability as a technique of behavioral control. This evidence indicates that when punishment is regularly employed to suppress behavior the punished individual (the inmate) tends to avoid personal contact with the punishing agents (the correctional staff). It appears, then, that the correctional officer who relies upon punishment to control inmate behavior destroys his ability to interact with the inmate and, consequently, whatever potential he possesses to serve as a rehabilitative agent. Of equal importance is the effect of the widespread use of punishment upon the potential for violence within the institution, for the experimental evidence also indicates that punishment calls forth from the punished

individual aggression that is directed toward the punishing agent and/or peers who are not themselves responsible for the punishment.

The extensive use of aversive control procedures to coerce individuals into action appears to generate reactions similar to those resulting from the use of punishment to suppress unwanted behavior. Individuals resist aversive control procedures. They work against the system that employs such techniques, and they counterattack, either verbally or physically, both those who represent the system and those who support it. Skinner (1968) posits that individuals who work mainly to escape or avoid aversive consequences discover other means of escaping. In the institutional setting, the alternatives employed are limited only by the ingenuity of the inmates, typically involving various forms of deception, coercion of peers, and, in some instances, elaborate shaping procedures directed towards the modification of the behavior of correctional officers. Viewed within this framework, the inmate subculture is an understandable outcome of the extensive use of punishment and aversive control, for it effectively diminishes the efficiency with which the institutional staff can carry out these procedures. Furthermore, the lack of any systematic encouragement of initiative or self-improvement within most correctional institutions compounds these effects. Adherence to the inmate subculture is the primary means the inmate has at his disposal to obtain those things, both tangible and intangible, that he desires.

As Skinner indicates, a problem equal in seriousness to the overt behavioral reactions to punishment and aversive control are the emotional and attitudinal components of these reactions. Fear and anxiety are characteristic of escape and avoidance, anger and hostility of resistance and counterattack, and resentment of sullen inaction. These, in turn, are among the classical features of the juvenile delinquent and the criminal. Combine them with the antisocial behavioral predispositions stemming from the existent control procedures and fostered by the inmate subculture and it appears that Ramsey Clark (1970) is accurate. Correctional institutions are indeed "factories of crime."

If these regressive effects of imprisonment are to be eliminated and the offender is to be better prepared for full participation in our society, it appears that the institutions themselves must adopt a behavioral management system--

1. that insures order and discipline with only minimal reliance upon the threat of punishment as a control procedure;

2. that provides for the performance of necessary maintenance tasks and work assignments without primary recourse to the coercive use of aversive control procedure; (These first two requirements are obviously closely related and, if met, attack what may be the most significant conditions underlying the regressive effects of imprisonment.)

3. that can be administered by appropriately trained and supervised correctional staff, thereby enabling the line correctional officer–the man who has daily contact with the inmate–to participate in the rehabilitation program rather than function as an agent of punishment;

4. that is compatible with and fosters the inmates' participation in formalized rehabilitation programs;

5. that approximates, as closely as possible, those conditions that exist in society itself, for, by so doing, the system best prepares the inmate for integration into that society.

If these conditions are to be realized, corrections must now begin to search for a science of behavior and a technology of behavior change that will enable it to replace its current ineffective strategies, which are, in large part, deduced from an amalgam of commonsense theories of human behavior and psychodynamic interpretations of the nature of deviancy. Behaviorism and applied behavior analysis–a science of behavior and its related technology of behavior change–have demonstrated significant potential for understanding and remediating human problems. Their more extensive utilization in criminal justice appears to be a natural extension of their application.

Applied Behavior Analysis

Applied behavior analysis (*Journal of Applied Behavior Analysis*, 1968–) is the relatively recent application of a complex of scientific assumptions, empirical definitions, general descriptive statements, and analytical procedures–generated in large part by the experimental analysis of behavior (*Journal of the Experimental Analysis of Behavior*, 1958–)–to the understanding and remediation of human problems. The scientific assumptions have been carefully articulated (Skinner, 1938; 1969; 1974); the empirical definitions and general descriptive statements have been clearly formulated and summarized (Ferster & Perrot, 1969; Whaley & Malott, 1971); and the analytical procedures have been thoroughly detailed (Kazdin, 1973; Sidman, 1960). There can be no doubt that the

principles discovered and elaborated through the experimental analysis of behavior have provided the scientist with a greater understanding of behavior than has previously been available. Nor can there be any doubt that these same principles are powerful tools that the practitioner can employ in the solution of human problems that have heretofore been found insoluble.

Early applications of this new technology dealt primarily with the remediation of problem behavior in the general areas of mental retardation, the psychoses, learning disabilities, mental health, and elementary and secondary education. These applications have been markedly successful. Brown (1971) reviewed the effectiveness of a variety of therapeutic procedures and concluded that those involving applications of the principles of this technology, when compared with alternative strategies, appear to offer:

> 1. Greater *effectiveness* as a treatment method; i.e., at least for some emotionally disturbed behaviors the results are often clearly superior.
> 2. Greater *efficiency* as a treatment method; i.e., in general it takes less time and fewer sessions to bring about desired changes in the patient's life adjustment.
> 3. Greater *specificity* in establishing goals and outcome of therapy; i.e., the specific end result of therapy is specified at the beginning of therapeutic work.
> 4. Greater *applicability* to a wider segment of the population; i.e., it covers a broad spectrum of maladaptive behaviors rather than, for example, being limited more or less to upper-class neurotic patients with above average intelligence, etc.
> 5. Greater *utilization* as a treatment method by various groups; i.e., [applied behavior analysis] can be used not only by the practitioners of the basic mental health disciplines themselves but by public health and other nurses, case workers, counselors, adjunctive therapists, teachers, etc., and even by parents (p.32).

Although the utility of applied behavior analysis has been amply demonstrated in a variety of mental health, health-related, and educational settings, only recently has there emerged the beginnings of a concerted effort to determine how its principles may be best applied to the problems facing workers in the areas of crime and delinquency. The "streetcorner research" or "subject-experimenter psychotherapy" of Slack and his associates (Slack, 1960; Schwitzgebel, 1964; Schwitzgebel & Kolb, 1964) are early examples of this movement. Their work in metropolitan Boston illustrates how the principles of applied behavior analysis may be employed in the community to encourage "unreachable" delinquents to participate on a voluntary basis in traditional forms of counseling and

psychotherapy, to acquire the skills necessary to obtain and hold employment, and to seek out and establish new friendships with nondelinquent peers.

More recently, Tharp and Wetzel (1969; Thorne, Tharp, & Wetzel, 1967) have trained paraprofessionals to employ applied behavior analysis in their work with youths referred to a university counseling center in Tucson, Arizona, for treatment of a variety of behavioral problems. The paraprofessionals, in turn, worked with significant others in the lives of these youths: parents, siblings, other relatives, unrelated adults, peers, etc., who were important to the youths because the youths either enjoyed their company or because they controlled access to activities that the youths enjoyed. The paraprofessionals aided the significant others in objectifying the problem behavior of the youths and in identifying contingencies that appeared to set the occasion for and maintain the behavior's occurrence. Intervention strategies were developed in which the significant others established new contingencies that both weakened the undesirable behaviors and strengthened alternative, desirable behaviors.

Of the 77 youths seen, approximately one-third had police records of one sort or another. These records ranged from 1 to 13 offenses, consisting of virtually everything from minor curfew violations to armed assault. The effect of the intervention strategies upon the behavior of the target individuals, as indexed by a six-month follow-up, was to reduce the number of youths who were committing offenses by 81% and the number of offenses committed by 68%. It appears that these procedures have the potential of breaking the chain of activities that eventually lead to incarceration in a juvenile correctional facility and, all too often, to adult crime.

Although most would agree that, whenever possible, aid for youths in trouble should be provided in their natural or foster homes, removal is sometimes required until the youth's behavior improves sufficiently to make aid in the home a feasible endeavor. Typically, the removal of youths from their homes results in their placement in large state training schools or reformatories. Recently, a concerted effort has been made to develop alternatives to the almost certain placement of these youths in remote institutions for delinquents. One such alternative is the establishment of small, community-based, home-style residential facilities wherein a pair of house-parents devote their full time to the rehabilitation of a small number of youths. The research conducted at Achievement Place in Lawrence, Kansas, has demonstrated that applied behavior analysis can be employed with considerable success in such a setting to resocialize youths thought to be "out of control" by both their parents and the court.

In a series of innovative experiments, the workers at Achievement Place have brought applied behavior analysis to bear upon such diverse problems as reducing aggressive statements and encouraging the completion of homework assignments (Phillips, 1968); promptness and room cleaning (Phillips, Phillips, Fixsen, & Wolf, 1971); the modification of articulation errors (Bailey, Timbers, Phillips, & Wolf, 1971); the home-based reinforcement of classroom behavior (Bailey, Wolf, & Phillips, 1970); and the comparison of the effectiveness of a variety of management systems (Phillips, Phillips, Wolf, & Fixsen, 1973). An important part of the Achievement Place approach is the services provided the families to which the youths will eventually return. The same procedures employed at Achievement Place to gain control of the youths' behavior are also taught to their real or foster parents so that they may maintain control as the youths are gradually reintegrated into family life. Outcome research reflects the success of this application of applied behavior analysis. Once the youths enter Achievement Place they have virtually no unpleasant contacts with the law, their public school attendance increases markedly, their academic grades improve, and these gains appear to be maintained as the youths return to their families (Phillips, Phillips, Fixsen, & Wolf, 1973).

Applied behavior analysis has also been deployed to aid in the treatment of delinquents in institutions. At the Karl Holton School for Boys near Stockton, California, three different kinds of activities have been identified and encouraged through the application of the principles of this technology (Jesness & DeRisi, 1973). The first was "convenience behaviors," important for the efficient and orderly functioning of the institution. The second was academic activities, which included the acquisition of learning skills and the demonstration of educational achievement. The third involved the remediation of "critical behavior deficiencies," identified by the use of the Jesness Behavior Checklist (Jesness, 1971) and thought to influence the probability of youths' success or failure on parole.

The CASE (Contingencies Applicable to Special Education) projects conducted at the National Training School for Boys in Washington, D. C., utilized the principles of applied behavior analysis to increase the academic skills of its youths and to prepare as many as possible either to return to the public school system or to pass the high school equivalency examination (Cohen & Filipczak, 1971; Cohen, Filipczak, & Bis, 1967). To meet these objectives, the CASE team established a twenty-four hour learning environment based upon the principles of this technology. As a result, academic skills and IQ's, as measured by standardized tests, increased, and positive attitudinal changes were observed

in the youths as well. Moreover, the program appears to have had positive effects upon the youths' postrelease adjustments. Although follow-up information indicates that the recidivism rate of the CASE youths was comparable to the national average, the youths stayed out of trouble and out of institutions for longer periods of time than comparable releasees (Filizczak & Cohen, 1972).

Recently, a beginning has been made in utilizing the principles and technology of applied behavior analysis with adult offenders in institutional settings. At Walter Reed Army Hospital in Washington, D. C., an experimental program was established to devise effective treatment strategies for delinquent soldiers who had been diagnosed as having character or behavior disorders (Boren & Colman, 1970; Colman & Boren, 1969). Most had records of repeated absences without leave (AWOL) and past histories that often included dropping out of high school, convictions for minor crimes, suicidal gestures, and difficulties with parents, school officials, police, and army officers. Homosexuals, drug addicts, and alcoholics were excluded from the program. The design of the treatment program, which simulated a functioning military unit, was based on the assumption that these men had failed in the military and, previously, in civilian life because of deficiencies in their behavioral repertoires.

Applied behavior analysis was employed to devise and validate effective strategies to teach the soldiers education and recreation skills, personal habit patterns, such as planning and performing consistently, and interpersonal skills that would make their presence and performance important to others, in this instance, to other members of their military unit. A follow-up comparison was made between 46 men released from the Walter Reed project and 48 comparable soldiers who received either routine disciplinary action or general psychiatric treatment. Of the soldiers in the Walter Reed group, 7 had completed their tour and 25 were functioning in a military unit (69.5% "success"), while 14 had either been administratively discharged from duty, were AWOL, or were in a stockade (30.5% "failure"). Of the comparison group, 1 had completed his tour and 12 were on active duty (28.3% "success"), while 33 were administratively discharged or in a stockade (71.7% "failure") (Colman & Baker, 1969).

The early work of the Experimental Manpower Laboratory for Corrections (EMLC), operated by the Rehabilitation Research Foundation and located at Draper Correctional Center in Elmore, Alabama, concentrated upon the development and implementation of efficient and effective means of providing adult offenders remedial academic instruction

and vocational skill training (Rehabilitation Research Foundation, 1968). Contingency management procedures were developed that resulted in increases in both the quantity and quality of academic work performed in the classroom (Clements & McKee, 1968). Overall progress in the program was substantial: offenders enrolled in the projects averaged gains of 1.4 grades per 208 hours of programmed instruction. High school equivalencies were earned by 95% of those who qualified for and took the GED, and nine former students entered college after leaving prison (McKee & Clements, 1971).

The Token Economy

One of the defining characteristics of the experimental analysis of behavior is its emphasis upon intensive study of the individual. It is not surprising, therefore, that the bulk of the early research in applied behavior analysis consisted of one or more treatment personnel working with a single individual (e.g., Ullman & Krasner, 1965; Ulrich, Stachnik, & Mabry, 1966). More recently, however, the desirability of employing applied behavior analysis techniques with individuals in various group settings has been recognized, and increasing effort is being expended in this direction (e.g., Ulrich, Stachnik, & Mabry, 1970; 1974). Research with institutionalized psychiatric patients has led to a technological advancement, formalized by Ayllon and Azrin (1968) and generally referred to by its key concept, the *token economy*, that retains the principles of applied behavior analysis and permits their systematic application in a wide variety of group settings. Indeed, much of the work in applied behavior analysis carried out in the juvenile and adult justice systems has employed the token economy.

The token economy has three defining characteristics: (1) a number of objectively defined goals or target behaviors, (2) the token itself, and (3) a variety of backup reinforcers (Krasner, 1970a; 1970b). The target behaviors are the potential activities or accomplishments of program participants that the staff consider important for treatment or rehabilitation and that they wish to encourage via the token economy. Based in part upon a clear value judgment, the activities identified here are also determined by the objectives of the program and current thinking concerning how these objectives may be best realized. They are those activities that will earn tokens once the token economy is operative.

The tokens are the medium of exchange in a token economy. They are earned by performing the target behaviors and expended to obtain the backup reinforcers. The tokens themselves may be tangible or intangible and take many forms: poker chips, green stamps,

credits in a credit card system, and points in a checkbook banking system. The token, then, may be any object or stimulus that can (1) be easily presented following the occurrence of a target behavior, (2) mediate the time between the target behavior and the availability of a backup reinforcer, and (3) be exchanged for the backup reinforcer once it becomes available. Like money, tokens are of value because their possession allows individuals within the token system to engage in high probability activities or to obtain prized commodities.

The backup reinforcers are the things of value to the program participants. They can include, among a number of other things, the opportunity to watch a favored television program, special foods, extra visiting or pass privileges, etc.–they are the ways and means of using the tokens. As has been indicated above, the value or *conditioned reinforcing properties* of tokens are determined by the value or reinforcing properties of the backup reinforcers. The number and variety of backup reinforcers must be as large as possible to (1) maximize the probability that the reinforcing event menu includes activities and commodities reinforcing to all participants and (2) to minimize the likelihood that satiation will reduce the token's conditioned reinforcing properties. Indeed, the term *generalized conditioned reinforcer* is appropriately applied to the token, for the token signifies that it may be exchanged for a host of conditioned and unconditioned reinforcers in much the same manner money is exchanged. Care must be exercised to insure that the tokens and backup reinforcers are obtainable solely through participation in the token economy, for a token or potential backup reinforcer that may be freely obtained by circumventing the contingency management system is of little utility.

To be maximally effective, the token economy must be designed and operated upon the realization that the reciprocity inherent in all human relationships (Azrin, Naster, & Jones, 1973; Stuart, 1971) also exists in the relationship between institution staff and program participants, whether the institution is a school, community mental health center, mental hospital, or correctional facility. Virtually all healthy human relationships involve some sort of equitable give-and-take exchange. Each participant both expects something of and provides something for the other. Indeed, those interpersonal relationships that are either themselves pathological or that breed pathology appear to be those in which this reciprocity is either distorted or completely lacking (Patterson & Reed, 1970; Patterson, Cobb, & Ray, 1972).

Two requirements of the token economy foster and protect reciprocity between institution staff and program participants. First, the token economy requires an explicit

statement of what each party, staff and participant, expects of the other and what, in return, each is expected to provide for the other. Second, the token economy also requires an accountability system, wherein the degree to which expectations are fulfilled and obligations are honored is monitored and may be held up to public scrutiny. In meeting these two requirements, the token economy guards against the shortcomings of alternative institution management and therapeutic endeavors. The clarification of expectancies fosters negotiations between both parties and helps insure that the resultant exchange system is balanced (i.e., fair to both parties). On-line accountability, long neglected by both the health-related and criminal justice professions, allows the continuous monitoring of a program's effectiveness while at the same time protecting each from either actual or false claims of capriciousness, inconsistency, or malevolence on the part of the other (Ayllon & Roberts, 1972).

It is traditional to view the various components of the token economy from the perspective of the program staff, and this orientation has provided the basis for the preceding discussion. The target behaviors have been depicted as those activities of the program participants that the staff wishes to encourage. Similarly, the backup reinforcers have been described as those activities or commodities that the staff controls and that are valued by the participants. It is, however, equally appropriate to examine the token economy from the perspective of the program participant. In so doing, the reciprocal nature of the reinforcement system becomes even more apparent. The target behaviors become the activities in which the staff engage as they provide the goods and services that the participants value. Similarly, the backup reinforcers become the activities and accomplishments that the staff wishes to encourage in the participants. To complete the parallel, it appears appropriate to conclude that the program participants reinforce the staff with the tokens as the staff provides them with goods and services, and that the tokens are of value to the staff because the staff may exchange them for the things they value–certain activities on the part of the program participants.

There are, of course, many differences between the program staff and program participants, in terms of both the decision-making power each wields and the potential backup reinforcers each possesses. The staff decision-making power is, in most settings, absolute. The staff of a residential institution leaves at the end of the workday to return to the "real world." The program participants merely observe the change of shifts as the program in their world continues. Consequently, the program participants possess few,

if any, powerful staff reinforcers, while the staff typically controls, either directly or indirectly, virtually all the program participants' reinforcers. All too often the staff views the program from its perspective alone and, in so doing, locks the program participants into a pathology-ridden system. Indeed, recent studies have indicated that mental hospitals contribute to the ills of many of their patients and correctional institutions increase the likelihood that many of their charges will again engage in criminal activities once they have been released. In a properly designed token economy, systematic safeguards are incorporated, in part, as a result of the attention paid to the reciprocity of human relationships. Such safeguards provide not only a more effective behavior management system but also optimal protection of the inmate from programmatic arbitrariness and from potentially harmful institutionalized treatment regimens.

Barriers to an Applied Behavioral Analysis Approach

The implications of the research exploring the feasibility and effectiveness of an applied behavior analysis approach to a variety of crime- and delinquency-related problems indicates that this technology has the potential for better enabling the criminal justice system to deal with the problems it now confronts. However, those in the criminal justice community have been reluctant to acknowledge this potential and, when they have done so, they have been slow to adopt the alternative procedures it offers. For example, following a brief overview of applied behavior analysis, the Task Force on Corrections of the prestigious National Advisory Commission on Criminal Justice Standards and Goals (1973) concluded:

> Most techniques of behavior modification have been generated either in the mental hospital or for educational use. Although their application to the correctional situation is not necessarily inappropriate, sufficient attention has not been given to the nature, scheduling, and limits of the reinforcement repertory available in the correctional apparatus. Thus the use of tokens for behavior reinforcement in a reformatory may not be a suitable application of an approach that works in mental hospitals, where the problems of manipulation for secondary gains are not so prominent (p.516).

In light of doubts such as these, one emphasis of the project reported upon herein was a thorough examination of the applicability of applied behavior analysis to the solution of problems peculiar to an institution for adult male offenders. Only after this has been accomplished will it be possible to adequately assess the feasibility of deploying this technology on a wide scale within the correctional system. More importantly, such research

is necessary to identify aspects of the technology that must be modified if these procedures are to be as effective in the adult institutional setting as they are in other settings. Undoubtedly, the correctional apparatus will dictate such changes. The questions that must be answered concern the degree of change that will be required and the requirements that must be met if a program of applied behavior analysis is to be successful in a correctional institution.

Objectives of the Cellblock Token Economy Project

Before it would be reasonable to expect that proposed innovations in correctional practices will be readily accepted and conscientiously deployed within the criminal justice field, it must be first demonstrated that these innovations are not only feasible, but that they also have the potential of assisting corrections administrators to more effectively meet their growing number of responsibilities. One practical concern of high priority to virtually all corrections personnel is meeting the day-to-day requirements inherent in the operation of any large institution–the preparation of meals, making sure that the fundamentals of personal hygiene are observed, etc. It frequently appears, however, that correctional administrators overemphasize these aspects of institution management, devoting a disproportionate amount of their time and energies to what most would consider rather perfunctory matters. Although this does undoubtedly reflect some administrators' general biases concerning the primary functions of their institutions, it is more likely for most administrators that the concern is a natural outcome of a realistic appraisal of their institutions' basic operating requirements, the widespread reliance upon inmate labor to perform routine institutional tasks, and the lack of a motivational system that better encourages inmate workers to fulfill these requirements than do the punitively oriented procedures currently practiced in virtually all American correctional institutions.

Until administrators develop the capability of easily meeting the basic requirements of institution management, it is unlikely that they will have either the time or the inclination to turn their fuller attention to the more general problems involved in preparing the offender for his eventual return to community life. Moreover, strategies which effectively achieve these ends are logical candidates for more extensive utilization in other areas of endeavor throughout the correctional system. For this reason, the objective of Experiment 1 was to explore the degree to which token reinforcement procedures could be effectively employed to motivate the performance of activities that administrators consider important for the orderly operation of their institutions. They consisted of such

things as encouraging inmates to arise at a determined hour, make their beds, clean the area in the general proximity of their bunks, and maintain a neat and well-groomed personal appearance. The objective of Experiment 2, which was an outgrowth of the findings of Experiment 1, was to determine the nature of the functional relationship between the magnitude of token reinforcement for a particular task and the probability that the task would be performed.

Two additional experiments focused upon the leisure-time remedial education program operated throughout the duration of the project. The academic deficiencies reflected in the inmate population of the token economy cellblock are characteristic of inmate populations in general. Some cannot read at all; and, of those who can read, most can do so only with difficulty. Reading comprehension is low, and basic mathematical skills are impoverished or absent. Programs to remediate these deficiencies should be of the highest priority in all correctional efforts, both institution and community based, for until such programs are universally available our society will continue in its failure to provide even the most basic services to the majority of inmates who pass through the correctional system. For the bulk of those who are released and do not recidivate, their competitive productivity in society is doubtlessly and strikingly limited by the absence of educational and vocational skills. And, perhaps more importantly, for those who are released and do recidivate, it may well be that the sheer absence of free-world options, compounded by a prison experience that did not include effective remedial education and vocational training, weighed heavily in their repeated offense.

These considerations dictated that the residents of the token economy cellblock be offered the opportunity to remediate their academic deficiencies and resulted in the establishment of a leisure-time adult basic education program that was operated on the cellblock throughout the duration of the project. Various means of encouraging participation in the education program were explored in Experiment 3. In addition, three formats for the presentation of programmed instructional material–one of which involved the participation of inmates as tutors of their peers–were compared in Experiment 4. Experiment 5 examined the effect of a procedure reinforcing "incompatible opposites" upon rule violation within the token economy itself. Finally, the manner in which inmates expend points was examined, as was the degree to which the token economy altered the day-to-day routine of the inmate participants.

GENERAL METHOD

Participants

Participants of the cellblock token economy were 56 inmates incarcerated at Draper Correctional Center, Elmore, Alabama, a maximum security state institution whose all-male population consists primarily of younger offenders serving sentences for their first or second felony conviction. The only general constraint governing consideration for participation in this project was that inmates be eligible for either parole or unconditional release within 90 days of the project's termination date. The initial population of the cellblock token economy consisted of 33 inmates. These 33 inmates were selected at random from those who had volunteered for participation in a Manpower Development and Training (MDT) Project operated by the Rehabilitation Research Foundation. A second random drawing determined which of these 33 filled the 20 positions open in the MDT Project. The remaining 13 inmates of the initial token economy cellblock population did not participate in the MDT Project but instead continued to perform their routine institutional work assignments.

The 23 inmates who later joined the token economy cellblock population as replacements for those who left the project were, within the guidelines of the general constraint mentioned above, selected at random from the general population of the institution. Although the transfer of these 23 inmates to the token economy cellblock was treated as a routine administrative procedure, these inmates, as well as the original 33 volunteers, could discontinue their participation in this project at any time they wished by submitting a standard request for a cellblock transfer to the institution's classification officer. Shortly thereafter (usually between 3 to 5 days), space was found in another cellblock and, if the inmate still desired to discontinue his participation in the cellblock token economy, the transfer was accomplished. The decision to discontinue participation in the project in no way altered the inmate's projected release date or lowered the general quality of his life within the institution relative to the period prior to his enrollment in the project. The average daily census during the course of the 420 days of the project was 22 inmates. The 56 participants (the 33 original inmates plus the 23 who later joined) resided on the token economy cellblock for an average of 99 days, with a range of 10 days to 352 days.

As Table 1 indicates, the mean age of the 56 inmates at the time of their entrance into the project was 23.6 years, with a range of 16 to 54 years; 42 (75%) were 25 years of age or younger. Thirty-one (55%) were white and 25 (45%) were black. Their mean grade level, as indexed by the Tests of Adult Basic Education (TABE), was 7.4 grades, with a range of 2.9 to 12.3 grades. The mean grade levels for the whites and blacks were 8.4 and 6.1 grades, respectively. Their mean IQ, as measured by either the Otis Test of General Ability or the Wechsler Adult Intelligence Scale, was 88.3, with a range of 64 to 112. The mean IQs for the whites and blacks were 92.6 and 82.6, respectively. Of the 56 inmates, 19 (34%) were sentenced from counties with populations greater than 250,000; 7 (13%) from counties with populations between 100,000 and 250,000; 12 (21%) from counties with populations between 50,000 and 100,000; 14 (26%) from counties with populations between 25,000 and 50,000; and 4 (7%) from counties with populations less than 25,000. The representation of the urban and rural portions of the state was, then, approximately equal in the population of the token economy cellblock.

Seventeen (30%) of the inmates had been previously incarcerated as adult felons, during which time they served an average of 15.0 months, with a range of 15 days to 120 months. The average length of the sentences that the 56 inmates were serving when they entered the project was 54.6 months, with a range of 12 to 300 months. The offenses for which the inmates had been convicted and were serving sentences when they entered the project are listed in Table 2. The distribution of offenses in the token economy cellblock population reflects that of the institution population in general. A large number of inmates had been convicted of multiple offenses. Crimes against property were the most common offenses, with relatively smaller numbers of inmates serving sentences for crimes against persons and for statutory or "victimless" crimes.

Setting

The inmates were housed and the project was conducted in the second (top) floor of one of Draper Correctional Center's six two-story wings. Access to the token economy cellblock was from the institution's central recreation area via two sets of stairs that emerged separately into a main corridor. The area was a remodeled dormitory that lent itself well to the project. As Figure 1 indicates, it was subdivided into various rooms that were used as dormitories, classrooms, study halls, recreational areas, and staff offices. It was adequately lighted and ventilated, and it provided sufficient floor space for both

TABLE 1

Normative Data on Residents of Token Economy Cellblock
(Number of Inmates, Race, Age, Grade Level, I.Q.)

	Age	Grade Level	I.Q.
All residents N = 56	Mean = 23.6 Range = 16-54	Mean = 7.4 Range = 2.4-12.3	Mean = 88.3 Range = 56-117
White residents N = 31 (55%)	Mean = 25.0 Range = 16-54	Mean = 8.4 Range = 2.4-12.3	Mean = 92.6 Range = 71-117
Black residents N = 25 (45%)	Mean = 21.9 Range = 17-33	Mean = 6.1 Range = 2.9-9.5	Mean = 82.6 Range = 56-107

TABLE 2

Offenses Committed by Residents of Token Economy Cellblock

Offenses	Number[a]	Percent
Crimes against property	55	69.6
Grand larceny	27	34.2
Burglary	17	21.5
Second-degree burglary	6	7.6
Buying, receiving, or concealing stolen property	4	5.1
Attempted burglary	1	1.3
Crimes against persons	13	16.5
Robbery	8	10.1
Assault with intent to murder	2	2.5
Child molestation	1	1.3
First-degree manslaughter	1	1.3
Second-degree murder	1	1.3
Statutory or victimless crimes	11	14.0
Escape	2	2.5
Possession of marijuana	2	2.5
Forgery	1	1.3
Perjury	1	1.3
Possession of barbiturates	1	1.3
Possession of LSD	1	1.3
Sale of marijuana	1	1.3
Violation of probation	1	1.3
Violation of state narcotics law	1	1.3

[a]The total number of offenses is greater than the number of residents of the token economy cellblock because a number of the residents were convicted of more than one crime.

the housing of the inmates and the operation of the project. All support (food, clothing, medical, etc.), general security, and custody-related services (supervision of telephone, mail, and visiting privileges, etc.) were provided by Draper staff. All inmates and project staff members were subject to and followed the general rules, regulations, policies, and procedures of the Alabama Board of Corrections.

SCHEDULE OF ROOMS

Room No.	Description
1	Classroom (15'4" x 30'0")
2	Study Room (9'4" x 13'0")
3	Office (10'0" x 14'6")
4	Office (21'4" x 12'0")
5	Free room (13'0" x 12'0")
6	Bath with toilet and lavatory
7	Bath with toilet and lavatory
8	Bath with toilet, lavatory, and urinal
9	Recreation Room (19'6" x 12'0")
10	Library (9'4" x 12'0")
11	Small dormitory, front (22'0" x 12'0")
12	Small dormitory, back (34'10" x 8'6")
13	Main bath with 6 shower stalls, 2 toilets, 3 lavatories, and double urinal
14	Large dormitory (67'6" x 12'0")
15	Store (11'0" x 12'0")
16	Lounge (12'0" x 12'0")
17	Television Room (27'2" x 8'6")
18	Office (10'0" x 10'0")
19	Testing Room (9'4" x 10'6")

LEGEND OF SYMBOLS

Symbol	Description
	Toilet
	Shower stall
	Lavatory
	Urinal
C	Closet
	Window

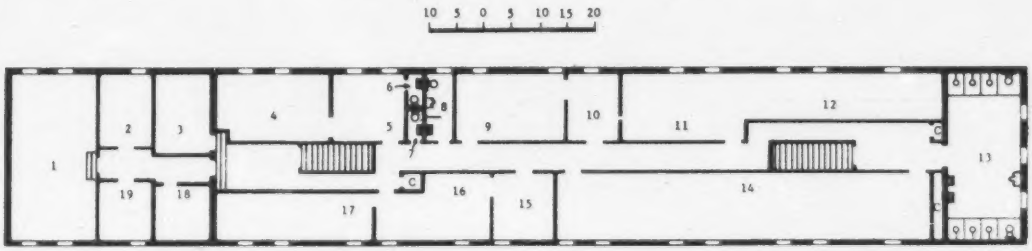


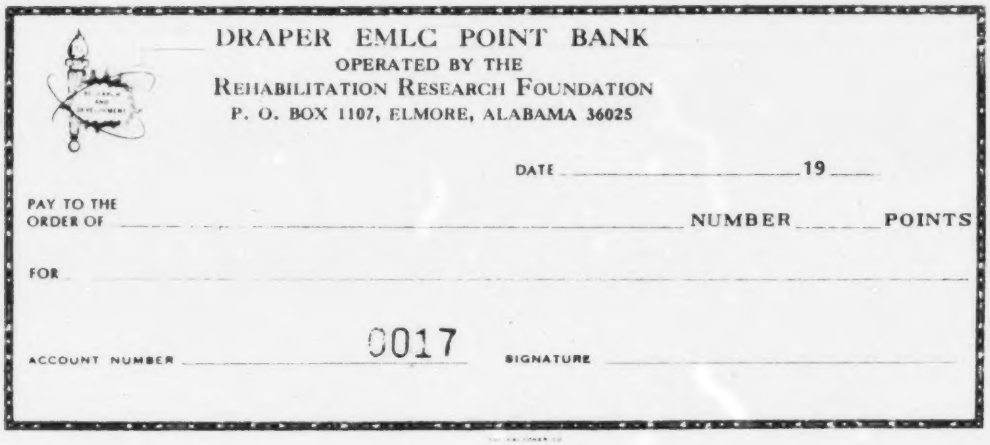
Fig. 1. Floor plan of the token economy cellblock.

Components of the Token Economy

Tokens

Tokens consisted of "EMLC Points" that were acquired and expended through a simulated checkbook banking system. Each inmate was provided with an individualized book of standard checks (see Figure 2). As inmates completed to-be-reinforced target behaviors or academic assignments, a staff member computed the number of points earned and instructed the inmates to credit those amounts to their accounts. At the same time,

the staff member recorded the performance of the tasks on a master data sheet or, if the points had been earned in the education program, on an education earnings summary sheet. These data were then employed to determine each inmate's total earnings at the end of the day. The use of the simulated banking system and the individualized accounts precluded the exchange of tokens among inmates, thereby reducing the ease with which the backup reinforcers could be "bootlegged" (acquired without first engaging in the target behaviors).


DRAPER EMLC POINT BANK
OPERATED BY THE
REHABILITATION RESEARCH FOUNDATION
P. O. BOX 1107, ELMORE, ALABAMA 36025

DATE _____ 19____

PAY TO THE ORDER OF _____ NUMBER _____ POINTS

FOR _____

ACCOUNT NUMBER 0017 SIGNATURE _____

Fig. 2. Sample check used by inmates to expend token economy points.

Backup Reinforcers

The backup reinforcers were items and activities that could be dispensed and monitored on the token economy cellblock. They consisted of such things as access to various reinforcing event areas (lounge, television viewing room, and poolroom); time in the institution at large (and, by means of this procedure, access to a wide variety of potential backup reinforcers, such as acquaintances not residing on the token economy cellblock, weekend movies, club meetings, and recreational activities available in the remainder of the institution); and small commodities (cigarettes, soft drinks, snacks, etc.) that could be "purchased" in a token economy canteen operated by the project. In addition, Sears' and Penney's catalogs were available for examination from the token economy canteen, and inmates wishing special items not regularly carried by the canteen

could order them if they appeared in either of the two catalogs. In order to do so, an inmate was required to deposit in a special savings account the point cost of the desired item, with transfers from checking accounts to the savings accounts limited to Sunday evenings. When the required amount had been accumulated in the special savings account, the canteen ordered the item from the catalog sales department of the company. Once the order was placed, inmates were prohibited from withdrawing points from the special savings account or from changing their order.

Target Behaviors

The target behaviors were the subject matter of the five experiments which composed this project. As such, they are described in detail in the body of this report. In general, they consisted of such things as the completion of four routine morning activities, performance of one or more assigned maintenance tasks, participation and performance in a remedial education program, etc. Typical payoff and cost values, respectively, of representative target behaviors and backup reinforcers are presented in Tables 3 and 4. It should be noted, however, that these values were subject to change in order to either maintain balance in the token reinforcement system or to answer experimental questions.

All well-designed token reinforcement systems "balance" target behaviors and backup reinforcers. That is, the relationship between the payoff values of the target behaviors and the costs of the backup reinforcers should be such that, when a participant performs that which is reasonably expected of him, he may, in turn, avail himself of a reasonable number of the backup reinforcers available within the system. Indeed, one of the more difficult tasks involved in the operation of a token reinforcement system is maintaining this balance. As time passes, the seasons change, the population experiences turnover, etc., the payoff values of the target behaviors and the costs of the backup reinforcers may need adjustment so that the system remains in balance and insures that performance of the target behaviors continues at its optimal level.

Daily Routine

The token reinforcement system was in effect for approximately seven hours each weekday (from 5:30 to 7:30 A.M. and from 4:30 to 9:30 P.M.) and for sixteen hours per day during weekends and holidays (5:30 A.M. to 9:30 P.M.) The hours of exclusion represent those times during which inmates were involved in other phases of institutional life. For most, this consisted of working on a routine institutional job (such as laboring

TABLE 3

Representative Token Economy Target Behaviors and Point Values

Target Behaviors	Points Awarded
1. Morning activities	
Up on time	60
Bed made	60
House neat and clean	60
Personal appearance	60
2. Educational activities[a]	
Student performance	2 per minute (estimated)
Tutor performance	2 per minute (estimated)
3. Assigned maintenance tasks[b]	
Sweep main hall (back half)	60
Empty trash cans in poolroom	60
Mop front steps and landing	120
Dust and arrange furniture in television room	120

[a]Students were paid on a performance- rather than time-contingent basis. Point values for units of academic material were based on the estimated study time per unit and awarded when the unit tests were passed.

[b]Although only four are shown, there was a sufficient number to insure that all residents of the token economy cellblock had the potential of earning 120 points through the completion of assigned maintenance tasks.

TABLE 4

Representative Token Economy Backup Reinforcers and Point Costs

Backup Reinforcers	Points Charged
1. Activities available on the token economy cellblock	
Access to television room	60 per hour
Access to poolroom	60 per hour
Access to lounge	60 per hour
2. Canteen items available[a]	
Cup of coffee	50
Can of soft drink	150
Ham and cheese sandwich	300
Pack of cigarettes	450
3. Free time away from token economy cellblock	1 per minute

[a]Although only four are listed here, a large number of items was available in the token economy canteen.

in a farm squad, assisting in the kitchen, working in the laundry, etc.). For the remainder, it involved participation in a formalized rehabilitation program (either the MDT project operated by the Rehabilitation Research Foundation or one of the Alabama state vocational school training programs).

The lights in each of the two dormitories were turned on at 5:30 A.M. each weekday. During the following two hours, each inmate could perform his four morning activities and assigned maintenance task(s) and then report having done so to the staff member on duty. The inmate then accompanied the staff member as he checked to insure that the reported performances met the established criteria of acceptability. If one or more did not, the inmate was informed of the deficiencies and encouraged to improve upon his performance. When the performances did meet the established criteria (either when first examined or after correction), the inmate was so informed, praised and given encouragement in one fashion or another, and, during the token economy, instructed to credit the number of points represented by the completed activities to his point account. At the same time, the staff member recorded the activities completed and points earned on the master data sheet. The procedures followed on weekend and holiday mornings were approximately the same as those followed on weekdays–the major differences involved alterations in time lines. For example, the lights in the dormitories were turned on two hours later (7:30 A.M. instead of 5:30 A.M.), and the inmate had two more hours (until 9:30 A.M. instead of until 7:30 A.M.) to complete and report the performance of the target behaviors.

If an inmate wished to enter a reinforcing event area during the hours the token economy was in effect, he first wrote a check in the required amount and deposited it in a collection box at the entrance to the area. An additional check was required at the beginning of each successive clock hour, from the half hour to the half hour (e.g., 4:30 to 5:30, etc.). Inmates could leave and reenter the reinforcing event area any number of times during each clock hour, the only requirement being that they had written a check for that clock hour and deposited it in the appropriate box. A warning bell sounded ten minutes prior to the half hour and again at the half hour. Staff members made aperiodic rounds throughout the day to insure that all inmates were abiding by the point expenditure system, to collect all checks near the end of each clock hour, and to prepare the deposit boxes to receive the next hour's expenditures.

Time spent in the remainder of the institution (areas other than the token economy cellblock) during the hours the token economy was in operation was recorded on time

cards that inmates punched on a time clock as they left from and returned to the cellblock. These times were then totaled and paid for at the end of each day. The token economy canteen was open one-half hour every evening and one additional half hour in the late morning on weekends and holidays. To obtain items from the canteen, inmates wrote checks in the exact amount of the to-be-purchased commodity and exchanged the check with the storekeeper for that item.

Early each morning during the period the token economy was operated the point record shown in Figure 3 was completed and posted. On it was an itemized accounting of each resident's earnings and expenditures on the previous day and the resultant balance carried forward to the present day. Those with overdrawn accounts were not permitted to purchase commodities from the token economy canteen, to gain access to the various reinforcing event areas on the token economy cellblock, or to spend time in the remainder

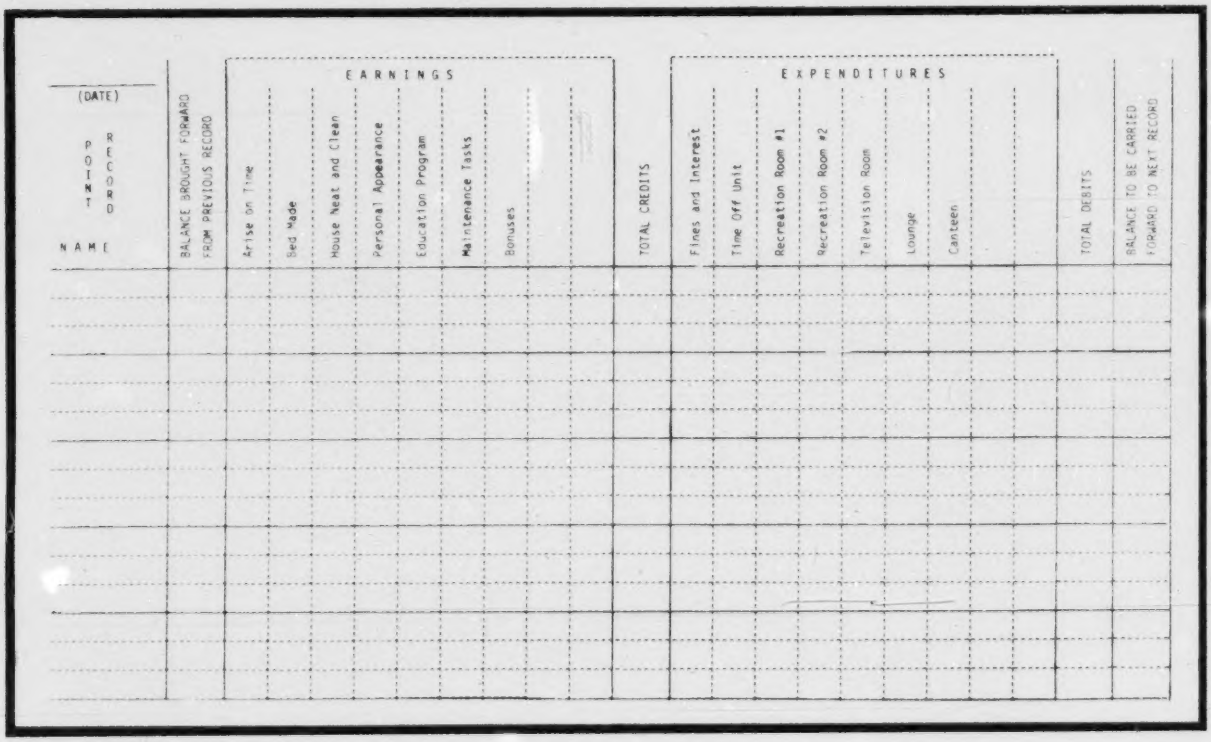


Fig. 3. Posted point record on which each inmate's daily transactions of earnings and expenditures in the token economy were displayed.

of the institution (but were allowed to leave the cellblock with no charge to obtain their meals, receive visitors, and tend to health needs) during the hours the token economy was in operation. These restrictions were lifted when a posted point record indicated that they had overcome their point deficits and that their accounts were no longer overdrawn.

A response cost (fine) procedure was employed to discourage the violation of three general rules governing the operation of the token economy:

1. Inmates who entered a reinforcing event area without first writing and relinquishing a check were fined the hourly cost of that area and then given the choice of either leaving the area or conforming to the token reinforcement system, i.e., writing a check and placing it in the deposit box.
2. Those who left the token economy cellblock for the remainder of the institution without first punching out on the timeclock were considered to have been off the facility since the last time the staff had evidence they were present (usually the time of the previous attendance check) and were charged for the time between then and their return to the facility.
3. Interest (at the rate of 10% of the overdrawn amount per day) was charged to all those with overdrawn accounts.

These three specific procedures were employed solely to guarantee adherence to the general rules governing access to the backup reinforcers, thereby insuring the integrity of the points and, by extension, the token economy itself.

EXPERIMENT 1: THE TOKEN ECONOMY AS A BASIS FOR THE MOTIVATION OF INMATE BEHAVIOR

Experiment 1 consisted of an investigation of the effect of token reinforcement procedures upon the performance of the four morning activities (i.e., arising at the appointed time, making the bed, cleaning the area adjacent to the bed, and presenting a neat and well-groomed appearance). The objective of this investigation was to determine (1) the degree to which token reinforcement procedures in an institution for adult male felons will motivate the performance of certain activities of general concern to correctional administrators and (2) the relative importance of particular components of the token reinforcement procedure in terms of their effects upon performance.

Response Definitions

The performance of each of the morning activities was evaluated in terms of objective scoring criteria that specified observable environmental conditions. Each inmate was briefed on the scoring criteria when he entered the project, and the criteria themselves were posted on the token economy cellblock bulletin board. The scoring was on an all-or-none basis. That is, only when all the criteria defining a particular morning activity were met was that activity scored as performed. If an inmate's performance did not meet the established criteria, he was informed of the deficiencies, and he was allowed the opportunity to improve upon his previous performance and to receive credit for the successful execution of the particular activity.

The criterion for the first morning activity, arising at the appointed hour, had to be met and scored between 5:30 and 7:00 A.M. weekdays and between 5:30 and 9:00 A.M. weekends and holidays. The criteria for the remaining three morning activities had to be met and scored between 5:30 and 7:30 A.M. weekdays and between 5:30 and 9:30 A.M. weekends and holidays. These cutoff times for arising at the appointed hour were selected, in part, in an attempt to overcome the inmates' established patterns of waiting until the last possible moment, leaping from their beds, dressing hurriedly, and rushing off for their morning work or school assignments just in time to avoid the consequences of being late. The earlier cutoff time for arising left the inmates sufficient time to complete the remaining morning activities. The later cutoff times for the remaining three morning activities allowed the inmates ample time to reach their morning assignments.

Within the time frames specified above, the scoring criteria for the four morning activities were as follows:

Arising at the appointed hour. An inmate was scored as arising on time when he was observed not in physical contact with any part of his or any other bed.

Bed made. An inmate was credited with having made his bed if the bottom sheet, top sheet, and first blanket (when present) were tightly tucked all around under the mattress; if the second blanket (when present) was folded and placed at the foot of the bed and on top of the top sheet or the first blanket; and if the pillow was smoothed, flattened, and placed at the head of the bed on top of the top sheet or the first blanket.

Clean area adjacent to bed. Different criteria were established for inmates assigned to top and bottom bunks. An inmate sleeping in a top bunk was scored as having cleaned the area adjacent to his bed if both the top of and the floor below the adjacent dresser were free of dust (to the touch) and trash (bits of paper, burnt matches, cigarette butts, etc.) and if these areas and the inmate's bunk were free of personal articles (clothing, towels, shoes, etc.). An inmate in a bottom bunk was credited with having cleaned the area adjacent to his bed if the floor beneath the bunk was free of trash and if that area and the inmate's bunk were free of personal articles (shoes were permitted below the bed if lined up beginning from the wall). If a bunk bed was occupied by only one inmate, that inmate was scored on the basis of the requirements for the occupants of both the top and bottom bunks.

Neat and well-groomed personal appearance. An inmate was credited with presenting a neat and well-groomed personal appearance if he were clean-shaven (to the touch), if his hair was combed, if his t-shirt and/or shirt was tucked into his pants, if his pants were zipped and/or buttoned, if his belt (when present) was buckled, and if his shoelaces (when present) were laced and tied.

In addition to these four morning activities, a list of maintenance tasks necessary for the general upkeep of the token economy cellblock was constructed. It consisted of such things as cleaning commodes in the cellblock latrine, sweeping portions of the central corridors, mopping floors, dusting or arranging equipment in the various reinforcing event areas, emptying trash containers, etc. Each task was objectively defined in the same manner as the four morning activities, and one or two tasks were assigned to each inmate. Assignments were rotated monthly and were based upon the task's estimated completion time (i.e., during one month an inmate might be assigned two tasks, each of which could be completed in a relatively short period of time, but, during another month, he might be assigned one task that took about the same time to complete as the previous two

combined). The maintenance tasks were not themselves dependent variables in any of the following five experiments and, consequently, are not reported upon herein. However, the payoff value for the performance of these tasks was increased and decreased in this experiment to eliminate possible indirect effects of the conditions explored. These changes and the rationale upon which they were based are detailed within the context of the experiment itself.

Reliability of Measurement

Although the four morning activities were defined as objectively as possible, there remained a possibility of judgment error or bias on the part of raters. Each morning a large number of decisions had to be made in a very short time concerning whether or not the performance of the skills was meeting the established criteria. In addition, most of the ratings on weekday mornings were conducted by the correctional officer assigned by the prison to the token economy cellblock. Although one correctional officer worked with the project staff throughout the project, the officer did not fully share the project staff's commitment to strict objectivity in scoring, and he was known to occasionally temper his judgment, being more stringent with some inmates and more lenient with others. It was therefore imperative that the reliability of the morning ratings be carefully assessed and that the resultant data be employed to help insure objectivity in ratings.

Two procedures were developed for determining the reliability of the raters. One measured the degree to which the correctional officer and the project staff members agreed in their simultaneous observations. The other estimated the degree to which the officer and members of the staff employed the same criteria when they rated the performance of the inmates in the absence of a second observer. In the first procedure, a traditional rater-rater reliability procedure, the correctional officer and a project staff member, on selected mornings, toured the token economy cellblock together and independently scored each inmate's performance of each of the four morning activities before the inmate was informed of whether or not his performance was satisfactory. The percentage of agreement was then determined for each activity by dividing the total number of agreements by the sum of the agreements and disagreements. Twenty-eight of these rater-rater reliability checks were performed throughout the course of the project. The reliability estimates from each of those checks are presented in Table 5. The overall agreement averaged 96%. The average agreement for arising at the appointed hour was 97%; for bed made, 96%;

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for cleaning the area adjacent to the bed, 96%; and for maintaining a neat and well-groomed appearance, 95%.

TABLE 5

Reliability of Measurement of the Completion of Morning Activities: Percent Agreement Between Two Observers Rating Simultaneously (First Procedure)

Observation Number	Percent Agreement for Each Target Behavior			
	Up on Time	Bed Made	Personal Appearance	Living Area
1	100	97	100	100
2	93	93	93	90
3	97	97	97	97
4	100	100	100	100
5	100	100	100	100
6	100	100	100	100
7	96	96	81	88
8	92	92	92	92
9	100	100	89	100
10	93	82	93	79
11	100	100	100	100
12	96	96	96	96
13	100	100	100	100
14	100	100	100	100
15	100	100	100	100
16	100	100	100	100
17	100	100	93	100
18	93	100	100	100
19	100	100	100	100
20	100	100	100	100
21	100	100	100	100
22	76	76	76	76
23	83	75	83	83
24	100	100	100	100
25	100	100	100	100
26	100	100	100	100
27	100	100	56	100
28	100	100	100	100
Average percent agreement	97	97	95	96

The high reliability estimates obtained in the rater-rater reliability procedure clearly demonstrate that the correctional officer and project staff members were in agreement in their scoring of the completion of the four morning activities. However, since it was possible that the correctional officer was rating the residents' performance objectively and in accord with the prescribed criteria on the days of rater-rater reliability checks and not doing so on other days, two alternative procedures were considered to test for such possible inconsistency. The most obvious procedure would have been to compute the percentage of agreement between the ratings of the officer during a routine rater-rater reliability check and on a morning when he worked alone. A high percentage of agreement would have indicated that the officer was employing the same criteria when he worked alone as when working with a project staff member. This procedure was rejected, however, because it would have been impossible to determine if the differences between the officer's ratings on the days when he worked alone and when he worked with the project staff member were a product of the possible effect of the presence of a second observer upon the inmate's performance, or actual differences in the criteria the officer employed when performing his ratings alone or with a second rater.

The procedure that was adopted in preference to that described above based reliability estimates upon correctional officer and project staff member ratings that were performed in the absence of a second observer, thereby eliminating any effect the presence of a second rater might have upon completion of the morning activities. An estimate of day-to-day variation in inmate performance was obtained by computing the percentage of agreement between the officer's ratings on two successive days. This estimate was then compared to the percent of agreement between the ratings of the officer and the ratings of a staff member obtained on successive days. This comparison was assumed to reflect both day-to-day variations in inmate performance *and* potential differences between the scoring criteria employed by the officer and the project staff members. Any systematic differences between the two pairs of ratings would then reflect differences in criteria of the officer and staff members. Both pairs of ratings were taken in the same week, perhaps Monday and Tuesday for the two ratings by the correctional officer and Tuesday and Wednesday for the rating by the correctional officer and the subsequent rating by the project staff member.

Eighteen such comparisons were performed during the course of the project and are summarized in Table 6. T-tests were used in the evaluation of the differences between

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the sets of ratings. The differences between the percentage of agreements in scoring arising at the appointed hour (t = 1.26, df = 17, $p > .05$), bed made (t = .270, df = 17, $p > .05$), personal appearance (t = .166, df = 17, $p > .05$), and maintenance of living areas (t = .449, df = 17, $p > .05$) did not reach significance, thereby failing to disconfirm the null hypotheses that there were no significant differences between the sets of ratings and indicating that the scoring criteria were applied in a similar manner by both the project staff members and the correctional officer when they worked alone. The two forms of reliability estimates viewed together not only indicate that the raters scored the morning activities in a consistent fashion during the traditional rater-rater reliability checks, but also that no discernible systematic biases were detected when observers rated the behavior in the absence of a second rater.

TABLE 6

Reliability of Measurement of the Completion of Morning Activities: Percent Agreement Between Correctional Officer (CO) Ratings on Two Consecutive Days and Percent Agreement Between Correctional Officer and Research Staff (RS) Ratings on Two Consecutive Days (Second Procedure)

	Percent Agreement for Each Target Behavior							
	Up on Time		Bed Made		Personal Appearance		Living Area	
Observation Number	CO-CO	CO-RS	CO-CO	CO-RS	CO-CO	CO-RS	CO-CO	CO-RS
1	71	82	74	82	88	88	62	71
2	53	66	69	81	81	84	56	50
3	94	76	94	76	91	76	91	79
4	94	91	94	91	88	91	94	91
5	50	56	50	56	50	56	50	56
6	96	96	96	96	96	96	96	96
7	93	100	96	96	96	96	96	96
8	62	67	62	62	62	62	62	62
9	94	82	94	82	94	82	94	82
10	93	100	93	100	93	100	93	100
11	93	96	96	96	96	96	86	96
12	96	100	88	100	96	100	88	100
13	95	100	100	95	100	100	100	95
14	100	100	100	100	100	100	100	100
15	100	100	100	100	100	100	93	100
16	100	100	100	100	100	100	100	100
17	100	100	100	93	100	100	100	93
18	85	100	92	100	92	100	92	100
Average percent agreement	87	90	89	89	90	90	86	87

Experimental Conditions

This experiment consisted of 13 experimental conditions: (1) *Baseline*$_1$, (2) *Officer Treats*, (3) *Baseline*$_2$, (4) *60 Points Noncontingent*$_1$, (5) *60 Points Contingent*$_1$, (6) *90 Points Contingent*, (7) *60 Points Contingent*$_2$, (8) *60 Points Noncontingent*$_2$, (9) *Zero Points*, (10) *60 Points Noncontingent*$_3$, (11) *60 Points Contingent*$_3$, (12) *Announce Baseline*$_3$, and (13) *Baseline*$_3$. Data collection was restricted to weekdays during the first three experimental conditions. It was expanded to include weekends when the token economy was introduced in the fourth experimental condition and continued on a seven-day-a-week basis for the remainder of the 420 days of the project.

Baseline$_1$. This and the following two conditions preceded the implementation of the token economy. In preparation for this condition, the scoring criteria for the four morning activities were explained to each inmate and posted on the token economy cellblock bulletin board. The inmates were informed that they were expected to complete each activity each day and that their performance would be recorded. During this condition, the correctional officer toured the token economy cellblock between 5:30 and 7:30 A.M. weekdays, with data collection forms attached to his clipboard, and openly recorded the activities completed by each inmate. The officer also provided feedback, prompts, and reinforcement to the inmates.

Inmates were informed of whether or not their performance of the morning activities met the scoring criteria. If an activity did not meet the performance criterion, the correctional officer instructed the inmate on how to correct his performance and encouraged him to do so. If an activity met the performance criterion, the officer acknowledged and praised the inmate's performance. The correctional officer refrained from the various coercive techniques typically employed to motivate performance in correctional institutions. No intimidation, threats, ultimatums, restrictions, extra work assignments, or disciplinary reports were employed during this condition.

Officer Treats. Throughout the *Baseline*$_1$ condition the correctional officer assigned to the token economy cellblock during the morning insisted that he could improve the inmates' performance of the morning activities if only he were given the opportunity to do so. This condition was introduced to evaluate the effect of traditional institutional control procedures upon the performance of the four morning activities. The correctional officer was not given complete freedom, however, to employ the full range of coercive procedures available to him. He was not permitted to write disciplinary reports, for these

could result in, among other things, an inmate's transfer to another cellblock within the institution or to another institution within the state system. The poor performers, "troublemakers," and outspoken would be selected out and only the "ideal inmates" would be retained. The result would be a highly selected population on the token economy cellblock. During this condition, the correctional officer employed the remainder of the procedures available to him to motivate inmate performance of the morning activities: intimidation, threats, ultimatums, curses, direct supervision, and extra work on the token economy cellblock.

Baseline$_2$. This condition was identical to the *Baseline*$_1$ condition. It was employed to verify the effect of the *Officer Treats* condition. This condition was identical to the *Baseline*$_1$ condition. The second baseline condition is necessary for the verification of the effects of the *Officer Treats* condition because people, in general, and inmates, in particular, are subject to a variety of pressures in their daily lives, and because it is therefore possible that a change in behavior is a result of these general pressures rather than some specific procedure that, by chance, is coincident with them. Alternatively, the effect of some condition might be masked by these general pressures. The opposing effects of the experimental condition and the general pressures might well be cancelled when occurring together.

The investigator, aware only of the conditions he is examining, might, then, falsely conclude that ineffective procedures are effective or, alternatively, that effective procedures are ineffective. The second baseline condition guards against this possibility. A return to the conditions in effect prior to a particular condition would be expected to recapture the level of performance observed during those prior conditions. The effects of the treatment condition are thus verified by this return-to-baseline procedure, for it is unlikely that the two planned changes would be coincident with two successive changes in the general life conditions of the individuals involved in the project. An expected change following an apparently effective condition validates the effect of that condition; no change calls the effectiveness of that condition into question. An unexpected change following an apparently ineffective condition calls the lack of effect of that condition into question; no change verifies the ineffectiveness of that condition.

60 Points Noncontingent$_1$. This condition was employed to determine the effects of general changes in the operation of the token economy cellblock that occurred with the introduction of the token economy (limited access to the backup reinforcers; the

availability of commodities, such as cigarettes and snacks, not previously available; etc.) upon the performance of the morning activities and to separate these from the specific effect of the contingent relationship between the performance of these activities and the awarding of EMLC points that was explored in the following conditions. Throughout this condition, the 60 EMLC points allotted for each of the four morning activities were awarded on a noncontingent basis (i.e., independent of whether or not the inmate's performance of the activities met the established criteria). The operation of the project was expanded to include weekends and holidays as well as weekdays, and project staff members, in order to collect the data for the second type of reliability estimate, began to occasionally score inmate performance and to award EMLC points in the absence of the correctional officer. The token economy was begun on and EMLC points were awarded from the first day of this condition. Beginning on the second day of this condition, inmates were required to exchange points in order to partake of the backup reinforcers of the token economy.

Either the correctional officer assigned to the token economy cellblock or a project staff member toured the cellblock each morning, rated the performance of the morning activities, and provided feedback, prompts, and verbal reinforcement, as was done during the *Baseline*$_1$ and *Baseline*$_2$ conditions (no intimidations, threats, or ultimatums were allowed). Each inmate was instructed to add 240 points (60 for each of the four morning activities) to his bank account regardless of whether or not he performed the morning activities. The points were then credited to the account of each inmate present on the cellblock that day, and they appeared on the next posted point record in the columns allocated to the four morning activities. Inmates not present on the token economy cellblock for one reason or another (e.g., in the infirmary, transferred to a county jail for a court appearance, etc.) were not awarded the noncontingent points.

60 Points Contingent$_1$. This condition establishes the specific effects of the contingent relationship between the performance of the morning activities and the awarding of EMLC points. The level of performance under this condition must be higher than that observed under both the pre-token economy baseline and points noncontingent conditions if it is to be concluded that the token economy is an effective motivator of performance. During this condition, 60 EMLC points were awarded on a contingent basis (i.e., only when performance met the established criteria) for each of the four morning activities.

The general procedure of the previous condition was continued throughout this condition. The correctional officer or staff member on duty each morning toured the

token economy cellblock, recorded the performance of the activities, and provided feedback, prompts, and verbal reinforcement. Unlike the previous condition, the raters instructed inmates to add points to their accounts only when the performance of one or more of the four morning activities met the established criteria. As during the previous conditions, corrections were allowed and fostered. When the performance of an inmate was below criterion, the particular deficiencies were indicated and the inmate was encouraged to remedy them. Points were awarded and the activity(ies) recorded as performed if and when an inmate remedied the indicated deficiencies. These preceding general procedures were followed throughout the remainder of the token economy, unless the contrary is indicated.

90 Points Contingent. This condition examines the effect of increasing the magnitude of token reinforcement upon the performance of the morning activities. During this condition, the number of points awarded for each completed skill was increased by 50% (from 60 to 90 points), raising the potential number of points that could be earned for the four morning activities by 120 points, i.e. from 240 to 360 points. To control the absolute number of points available within the token economy during this period and, by this procedure, possible effects of reinforcement density per se upon performance, the potential payoff to each inmate for the completion of assigned maintenance tasks was reduced by 120 points.

60 Points Contingent$_2$. The procedures followed during this condition were identical to those followed during the *60 Points Contingent*$_1$ condition. It and the *60 Points Contingent*$_1$ condition verify the effect (or lack thereof) of the *90 Points Contingent* condition, in the same manner that the *Baseline*$_1$ and *Baseline*$_2$ conditions verify the effect of the *Officer Treats* condition. The potential payoff to each inmate for the completion of maintenance tasks was increased by 120 points.

60 Points Noncontingent$_2$. The procedures followed during this condition were identical to those followed during the *60 Points Noncontingent*$_1$ condition. The two *60 Points Noncontingent* conditions validate the effects of the two *60 Points Contingent* conditions and the motivating effects of the contingent relationships between payoff and performance involved in the token economy itself.

Zero Points. This condition compares the relative effectiveness of noncontingent reinforcement and no reinforcement in maintaining the performance of the morning activities. During this condition, the 240 points that had been awarded on a noncontingent

basis in the *60 Points Noncontingent*$_2$ condition were no longer awarded. To again control for the absolute number of points available within the token economy and for the possible effects of reinforcement density per se upon performance, 240 points were added to the potential payoff to each inmate for the completion of assigned maintenance tasks.

60 Points Noncontingent$_3$. This and the *60 Points Noncontingent*$_2$ conditions verify the effect of the *Zero Points* condition. This condition was identical to the *60 Points Noncontingent*$_2$ condition. The potential payoff to each inmate for the completion of maintenance tasks was reduced by 240 points.

60 Points Contingent$_3$. This condition was identical to the *60 Points Contingent*$_2$ condition. It remained in effect for the duration of the token economy. However, additional procedures in other components of the token economy were examined during this latter portion of the project and are described in subsequent experiments.

Announce Baseline$_3$. This condition preceded the return to the baseline condition. One week prior to the termination of the token economy all inmates were informed of the day the token economy would end, and a notice to that effect was placed on the token economy cellblock bulletin board.

Baseline$_3$. The token economy was terminated and the procedures followed during this condition were identical to those in effect during the *Baseline*$_1$ and *Baseline*$_2$ conditions. As such, it completes the verification of the effects of the various conditions explored during the course of the first experiment.

Results

The effects of the various experimental conditions upon the daily performance of the morning activities are shown in Figures 4 through 8. Figure 4 depicts the percentage of inmates arising at the appointed hour; Figure 5 depicts the percentage of beds made; Figure 6 depicts the percentage of areas adjacent to each bed that passed inspection; and Figure 7 depicts the percentage of inmates maintaining a neat and well-groomed personal appearance. Figure 8 summarizes the preceding four figures and depicts the percentage of all four morning activities that were completed each day under the various conditions of the project.

A comparison of Figure 8 with Figures 4 through 7 indicates that the summary data closely parallel those of the four individually presented morning activities. The major exception to this parallel lies in the comparison between the summary data and the

percentage of inmates arising at the appointed time as depicted in Figure 4. The obvious low points in Figure 4 reflect inmate performance on weekends and holidays. Here, the propensity to sleep late made itself known in a disproportionate drop in the percentage of inmates arising on time in comparison to their performance of the remaining three morning activities, which had a later cutoff time. Despite this, the patterns of behavior that emerged under the conditions examined indicate that the effects of the procedures explored in this experiment upon this, the most disparate of the four morning activities, were similar in kind if not in magnitude to those for the remaining three activities.

The following examination of the effects of the experimental conditions will deal primarily with the summary data and then with one or more of the activities only when those data deviate from the summary data to a sufficient degree. The independent samples *t*-test (Winer, 1962) was employed to aid in the analysis of the effects of the experimental conditions. Its use is justified here, for it was employed to test what would be generally considered to be predesignated hypotheses rather than applied indiscriminately in the mere search for statistical significance.

Baseline$_1$. During the eleven days of this condition, the mean percentage of morning activities that met the performance criteria was 66.4%.

Officer Treats. A mean of 63.7% of the four morning activities met criterion during the nine days of this condition, wherein the correctional officer attempted to insure their performance. This was not significantly different from the level of performance under the *Baseline*$_1$ condition ($t = .292$, $df = 18$, $p > .05$). Examination of the data suggests that a downward trend may have been emerging during the last two days of this condition, possibly because (1) it became apparent that the correctional officer was issuing threats and ultimatums that he did not carry out, and/or (2) the correctional officer in his more traditional role as dispenser of negative reinforcers diluted his power as prompter and dispenser of positive social reinforcers.

Baseline$_2$. During this five-day return-to-baseline probe, the mean percentage of morning activities meeting the performance criteria was 68.6%. This was not significantly different from the level of performance observed under either the *Baseline*$_1$ condition ($t = .372$, $df = 14$, $p > .05$) or the *Officer Treats* condition ($t = .493$, $df = 12$, $p > .05$). It may be concluded, therefore, that the *Officer Treats* condition had no significant effect upon the performance of the morning activities. The data from these first three conditions were combined and employed as the overall pre-token economy baseline against

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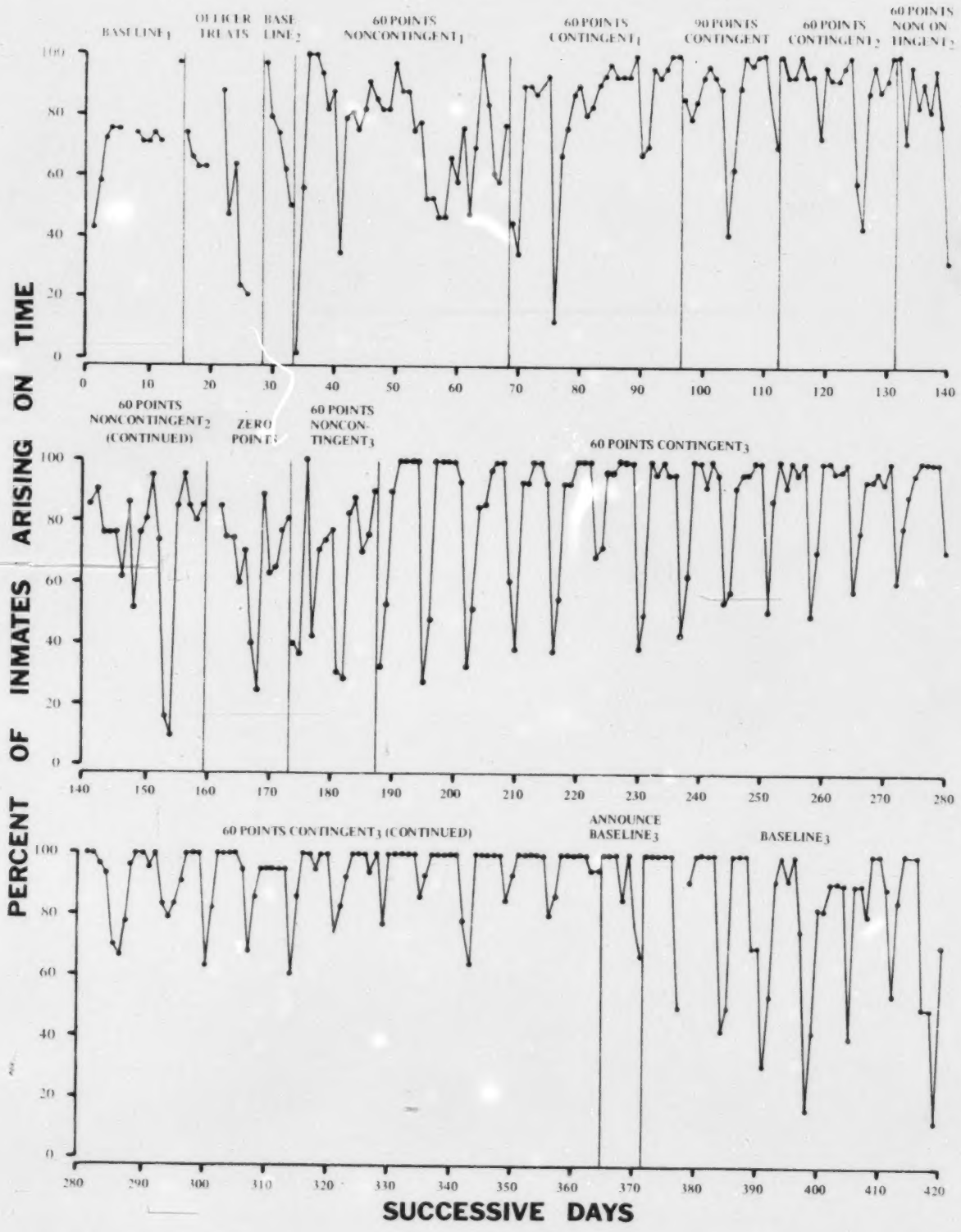

Fig. 4. Daily percentages of inmates arising on time under all experimental conditions of Experiment 1.

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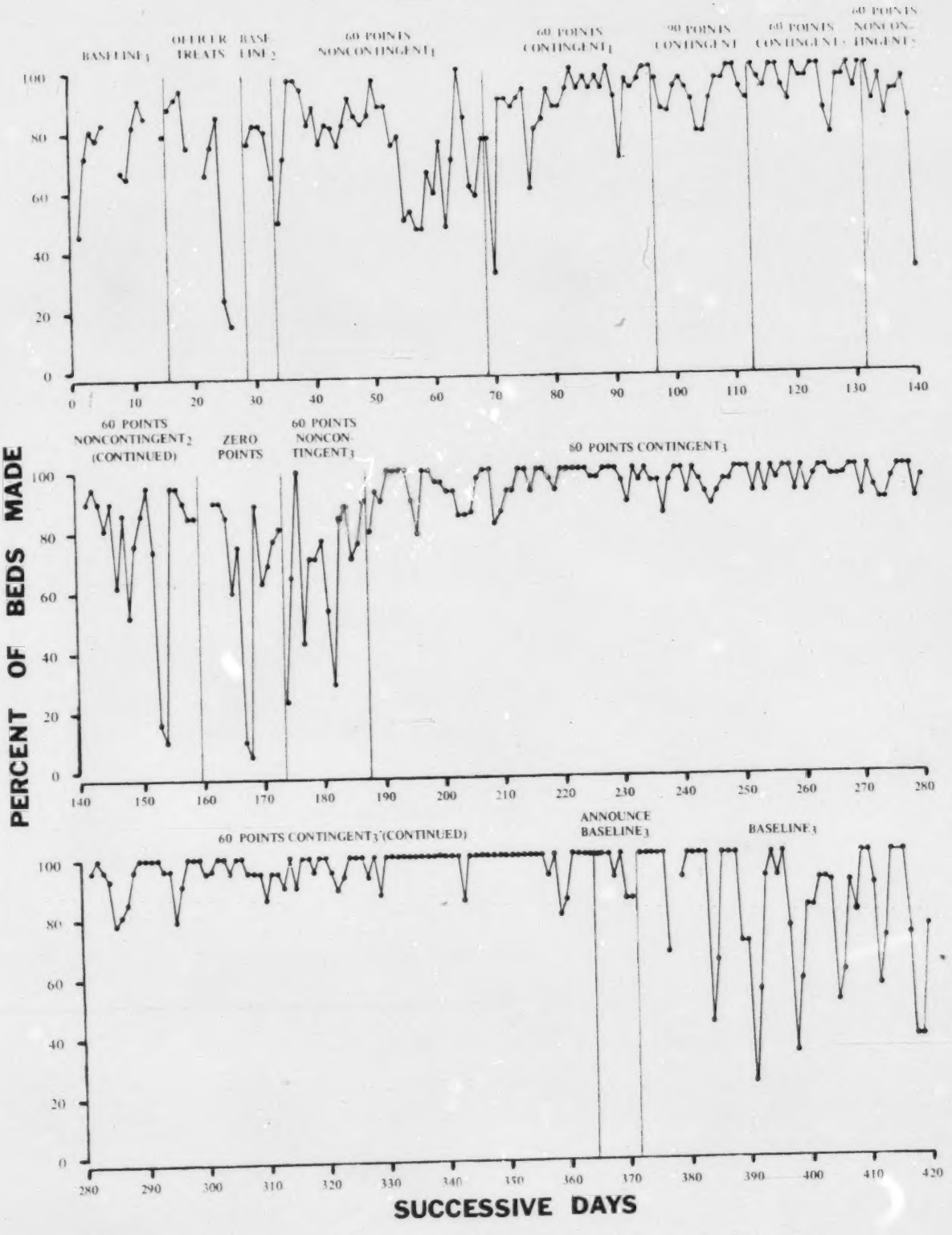

Fig. 5. Daily percentages of inmates making their beds under all conditions of Experiment 1.

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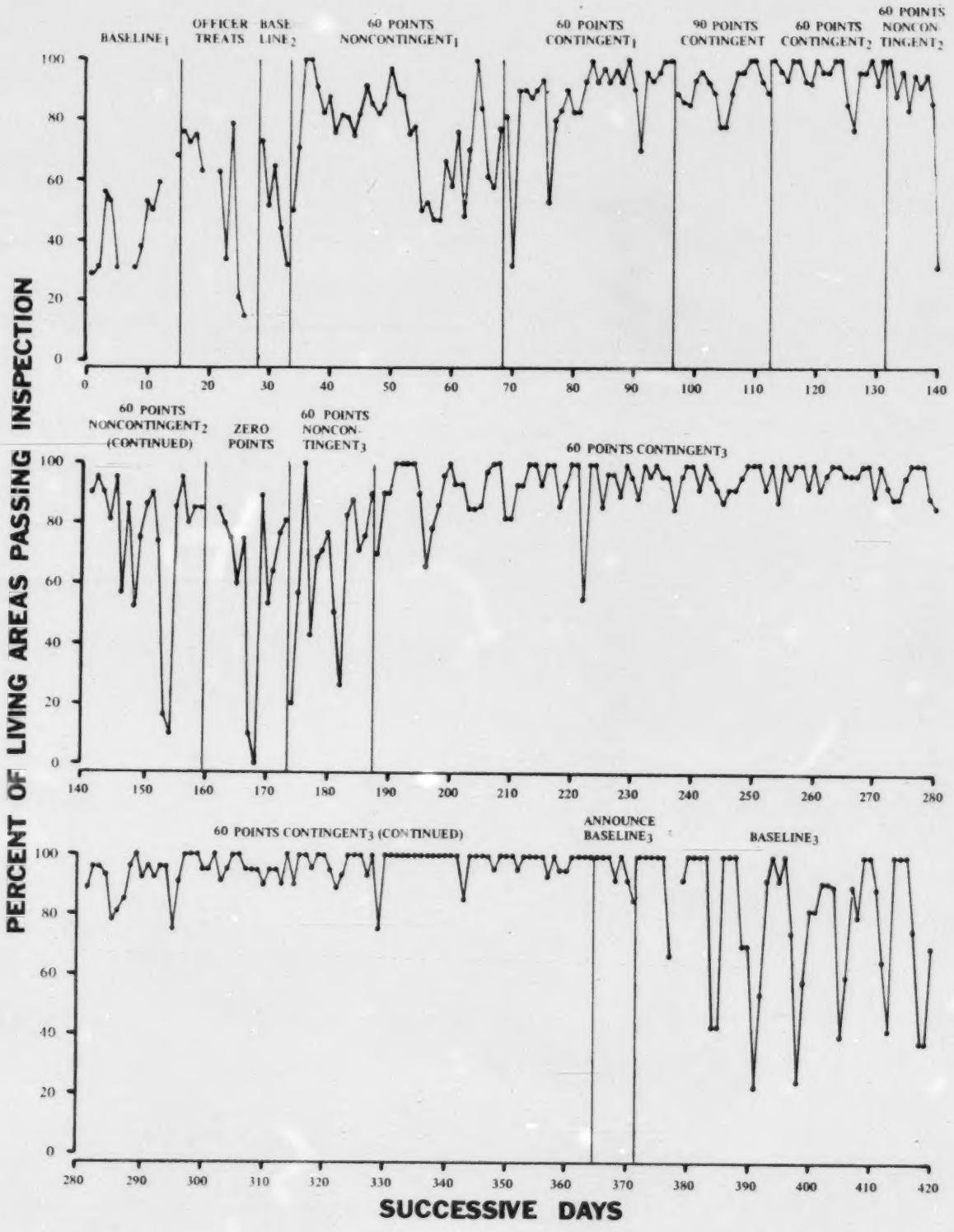

Fig. 6. Daily percentages of inmate living areas passing inspection under all conditions of Experiment 1.

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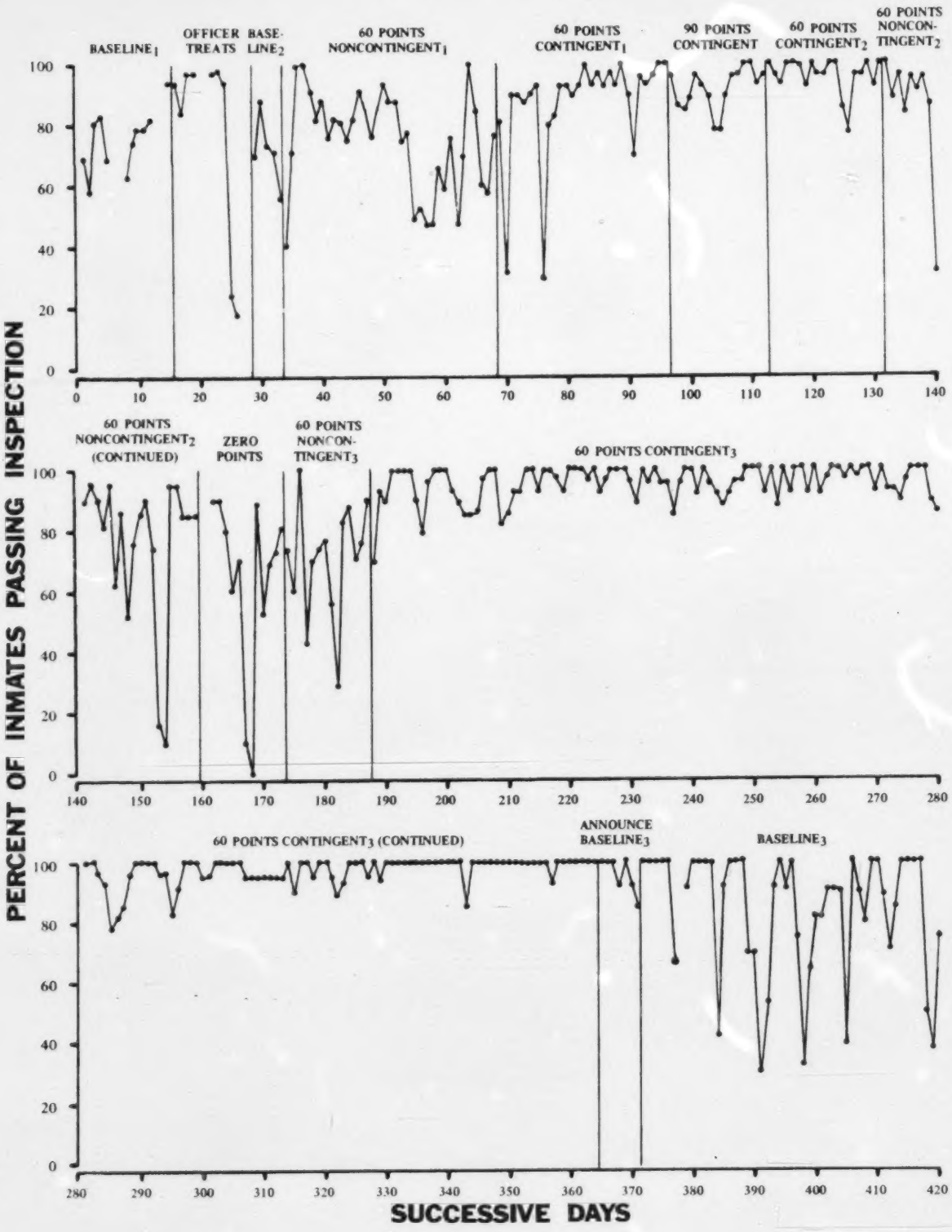

Fig. 7. Daily percentages of inmates passing personal appearance and grooming inspection under all conditions of Experiment 1.

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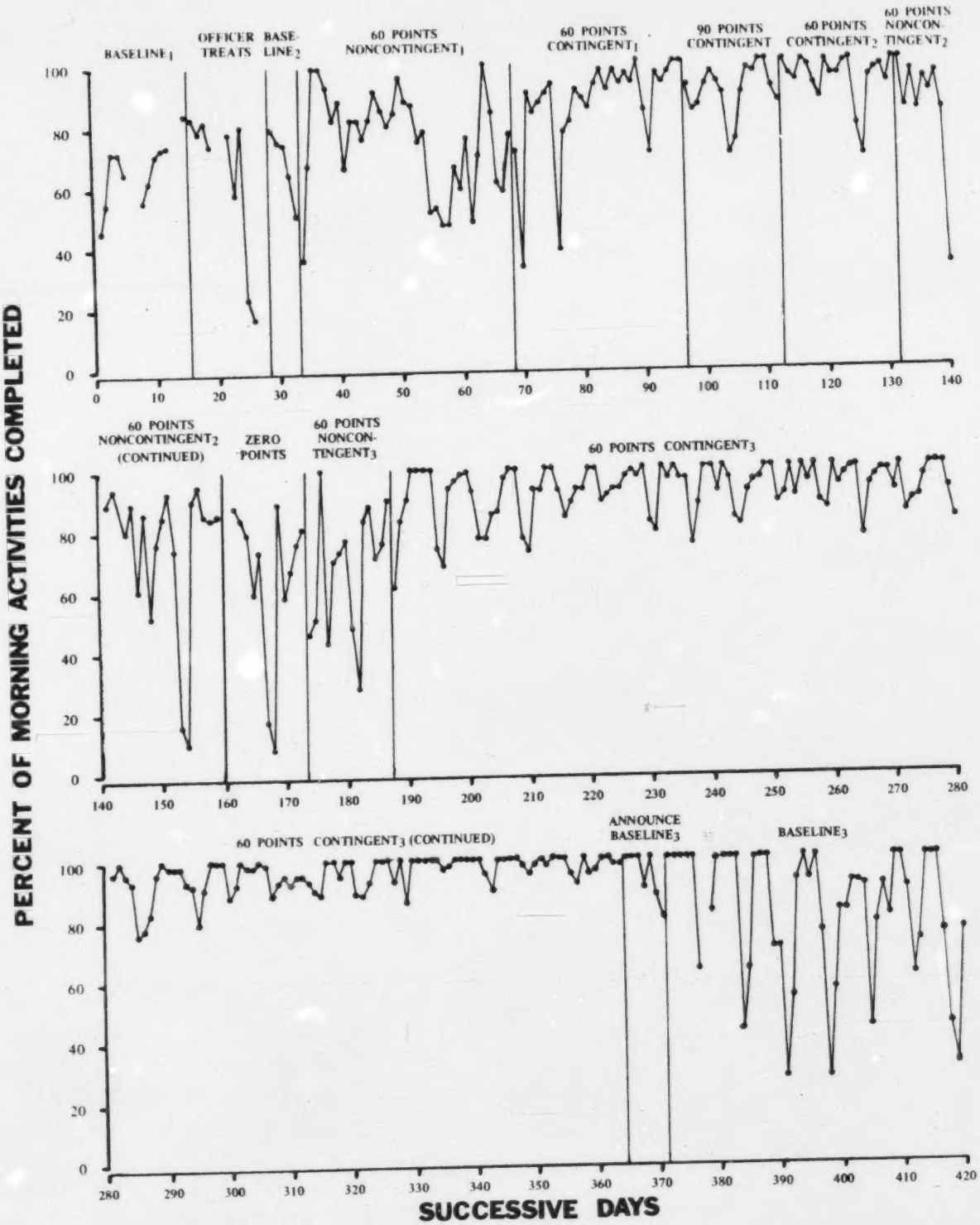

Fig. 8. Daily percentages of all morning activities completed under all conditions of Experiment 1.

which to compare the effects of the various token economy conditions. A mean percentage of 65.8% of the morning activities was completed during the 25 days of this pre-token economy period.

60 Points Noncontingent$_1$. The mean percentage of morning activities completed during the 35 days of this condition rose to 74.7%, significantly higher than the 65.8% average during the pre-token economy period (t = 1.964, df = 58, $p < .05$). Examination of the data suggests, however, that there was an initial improvement in performance following the introduction of the token economy but that this improvement was transitory, with performance during the latter half of the condition being lower than that during the first half and comparable to that of the pre-token economy baseline.

These suggestions were borne out. The mean percentage of morning activities meeting the performance criteria during the first half of this period (82.0%) was significantly higher than the percentage completed during the second half (66.9%) (t = 2.931, df = 33, $p < .05$), with the mean percentage of activities completed during the second half not significantly different from that of the pre-token economy period (t = .202, df = 40, $p < .05$). It appears, then, that the introduction of the token economy per se had a facilitative effect upon the performance of the four morning activities, but that this improvement was short-lived, with the level of performance gradually returning to that observed during the pre-token economy baseline periods. For this reason, the level of performance that emerged during the latter half of this condition was used in comparing the effects of this contingency with those subsequently examined.

60 Points Contingent$_1$. A mean of 86.0% of the morning activities met criterion during the 28 days of this condition. This was significantly higher than the performance levels observed during both the latter half of the *60 Points Noncontingent*$_1$ condition (t = 3.850, df = 43, $p < .05$) and the *60 Points Noncontingent*$_1$ condition taken in its entirety (t = 2.577, df = 61, $p < .05$). Moreover, the performance of the activities improved over the course of this condition, with the mean percentage completed during the second half (93.3%) being significantly higher than that of the first half (78.6%) (t = 2.623, df = 26, $p < .05$). The introduction of the response-contingent award of tokens appears to have precipitated an improvement in performance, with approximately 90% or more of the morning activities typically completed during the last 14 days of this condition, a level of performance that is markedly higher than that of any previous period.

90 Points Contingent. This condition sought to assess the effect of a moderate (50%) increase in token reward upon the performance of the to-be-reinforced behavior. During

the 16 days of this condition, the mean percentage of activities scored as completed was 89.6%, not significantly different from the percentage completed under the second half of the *60 Points Contingent*$_1$ condition (t = 1.232, df = 28, $p > .05$), indicating that in this situation the 50% increase in the magnitude of token reward had no facilitative effect upon performance.

60 Points Contingent$_2$. This condition is employed in the verification of the *90 Points Contingent* condition. As would be predicted, the level of performance during the 19 days of this condition (a mean of 93.6% of the morning activities completed) was not significantly different from that of either the *90 Points Contingent* condition (t = 1.404, df = 33, $p > .05$) or the second half of the *60 Points Contingent*$_1$ condition (t = .103, df = 31, $p > .05$).

60 Points Noncontingent$_2$. This condition is employed in the verification of the two preceding *60 Points Contingent* conditions. As would be predicted, the level of performance during the 28 days of this condition (78.1% of the morning activities completed) was significantly lower than that of both the second half of the *60 Points Contingent*$_1$ (t = 2.343, df = 40, $p > .05$) and the *60 Points Contingent*$_2$ (t = 2.768, df = 45, $p > .05$) conditions, but not significantly different from the level of performance under the second half of the *60 Points Noncontingent*$_1$ condition (t = 1.704, df = 43, $p < .05$).

Zero Points. This condition allows a comparison of the effect of the noncontingent award of tokens upon performance with performance in the absence of any token award. During the 12 days of this condition, a mean of 65.0% of the morning activities was completed, not significantly different from the level of performance under the *60 Points Noncontingent*$_2$ condition (t = 1.561, df = 40, $p > .05$).

60 Points Noncontingent$_3$. This condition validates the *Zero Points* condition. As would be predicted, the level of performance during this condition (67.4% of the morning activities completed) was not significantly different from the level of performance under either the *60 Points Noncontingent*$_2$ condition (t = 1.422, df = 40, $p > .05$) or the *Zero Points* condition (t = .256, df = 24, $p > .05$).

60 Points Contingent$_3$. This condition was in effect for the remainder of the token economy. Examination of the accompanying figures reveals that the token economy induced and maintained a high level of performance for the 177 days this condition was in effect. A mean of 94.1% of the morning activities was completed during this condition. As would be predicted, this level of performance was higher than that observed during

the preceding *60 Points Noncontingent*$_3$ condition (t = 10.483, df = 189, $p < .05$) but not significantly different from that of the preceding *60 Points Contingent*$_2$ condition (t = 0.258, df = 194, $p < .05$).

Figure 8 suggests that the level of performance of the group was steadily improving throughout this condition, and this observation is supported when performance during the first half of this condition is compared to that during the second half (t = 3.105, df = 175, $p < .05$). However, during the 177 days of this condition, the token economy cellblock population experienced a high degree of turnover, with the original members of the population being released and replacements being added. To determine if the apparent improvement was an artifact of this turnover or was indeed a real phenomenon, the performances of the 14 inmates who resided on the token economy cellblock for the entire period of this condition were examined. This examination revealed that their performance during the first half of this condition was not significantly different from that during the second half (t = 0.771, df = 175, $p > .05$), indicating that the apparent improvement must be attributed to changes in the inmate population rather than to real changes in the performance of the residents of the token economy cellblock.

Announce Baseline$_3$. Performance of the four morning activities during this one-week period preceding the termination of the token economy and the return to the baseline conditions averaged 93.7%.

Baseline$_3$. This condition completes the validation procedure for the token economy itself. As would be predicted, the percentage of morning activities completed during this condition (81.3%) was significantly lower than that during the preceding *60 Points Contingent*$_3$ condition (t = 6.436, df = 223, $p < .05$). Contrary to what would be predicted, performance during this condition was significantly higher than that observed during the pre-token economy baseline periods (t = 3.037, df = 71, $p < .05$). However, an examination of the accompanying figures suggests a steady decline in performance over the course of this condition. Although the difference between the percentage of activities completed during the second half of the condition (76.5%) was not significantly lower than that during the first half (86.1%) (t = 1.525, df = 46, $p > .05$), neither was the percentage of activities completed during the second half of this condition significantly different from the percentage of activities completed during the pre-token economy baseline periods (t = 1.886, df = 47, $p > .05$).

Individual Performance Records

The group data discussed above reveal that the various contingencies subjected to experimental examination had clear effects upon the performance of the token economy cellblock population in general. It is tempting to conclude that the increases and decreases in the percentage of morning activities completed by the inmate group under the conditions evaluated are representative of similar increases and decreases in the probability that any given inmate within the group will complete the activities on a particular day. Indeed, such conclusions are common when traditional group statistical procedures are the sole basis for an analysis of experimental results.

It is equally likely, however, that the group data accurately reflect the behavior of only a portion of the inmates who compose the group. During the first third of the study, for example, some inmates might have performed the morning activities almost every day, while others might have performed them only rarely, regardless of the contingency in effect. The group data might only reflect the performance of a third group of inmates who responded to the changes in the conditions examined here. If such were the case, conclusions drawn from the group data concerning the general effect of the various contingencies upon the expected behavior of the "typical" inmate would be unwarranted. The performance of the bulk of the inmates might well have been *unaffected* by conditions that were erroneously interpreted as having had clear and decisive effects upon each's behavior. An examination of the performance of individual inmates precludes the possibility of drawing such erroneous conclusions.

As would be expected, a review of the inmates' individual records revealed considerable variation in overall performance levels. Some inmates performed at consistently high levels throughout the various experimental conditions, and others showed only moderate overall performance levels. Although some of the inmates showed low levels of performance during some of the contingencies examined, none showed low overall levels of performance. Cumulative records for representatives of the highest performers (J.C.) and lowest performers (J.D.) throughout the first third of the project are shown in Figures 9 through 13. The effects of the various contingencies upon each inmate's arising at the appointed hour, making his bed, cleaning the area adjacent to his bed, and presenting a neat and well-groomed personal appearance are seen in Figures 9 through 12, respectively, while their effect upon the performance of the four morning activities taken together is shown in Figure 13. In these cumulative records, responses are accumulated along the vertical

dimension and days are displayed along the horizontal dimension. The number of responses occurring on the second day (zero or one for each of the four morning activities; and zero, one, two, three, or four for the cumulative record combining the four activities) is added to the number of responses occurring on the first day. The number of responses occurring on the third day is then added to the summed number of responses occurring on the first and second days, etc.

The performances of J.C. and J.D. approximate an "envelope" that roughly contains the performances of the remaining inmates of the token economy cellblock. It can be seen from the cumulative records that there are differences in each's local levels of performance: J.D. appears to have had the highest level of performance of the two during the three pre-token economy phases. The performance of J.C. increased radically following the introduction of the token economy, however, while the performance of J.D. continued relatively unchanged during the *60 Points Noncontingent*$_1$ condition. J.D.'s performance then improved markedly during the *60 Points Contingent*$_1$ condition and continued at a moderately high level during the *90 Points Contingent* and *60 Points Contingent*$_2$ conditions, while J.C.'s performance continued relatively unchanged. J.D.'s performance deteriorated during the *60 Points Noncontingent*$_2$ condition and continued at a low level throughout the *Zero Points* and *60 Points Noncontingent*$_3$ conditions. J.C.'s performance showed only some disruption during the *60 Points Noncontingent*$_2$ condition, however, and then a somewhat lowered level during the *Zero Points* and *60 Points Noncontingent*$_3$ conditions. Although the performance of both improved during the *60 Points Contingent*$_3$ condition, the performance of J.C. was somewhat more consistent than that of J.D.

As would be expected, however, the similarities in the patterns of J.C.'s and J.D.'s performances in response to the contingencies examined are far more striking than are the differences in their local rates of responding. The various contingencies examined affect the performance of both in the same manner, but to differing degrees. The behavior of neither was affected by the *Officer Treats* condition, with both showing fairly low levels of performance throughout the three pre-token economy phases. The performance of both was highest during those conditions in which token award was contingent upon performance (the *60* and *90 Points Contingent* conditions) and lowest when token award was unrelated to performance (the *60 Points Noncontingent* conditions) or absent (the *Baseline, Officer Treats*, and *Zero Points* conditions).

The various contingencies explored in this experiment clearly exerted some influence upon the behavior of the residents of the token economy cellblock. Moreover, the manner

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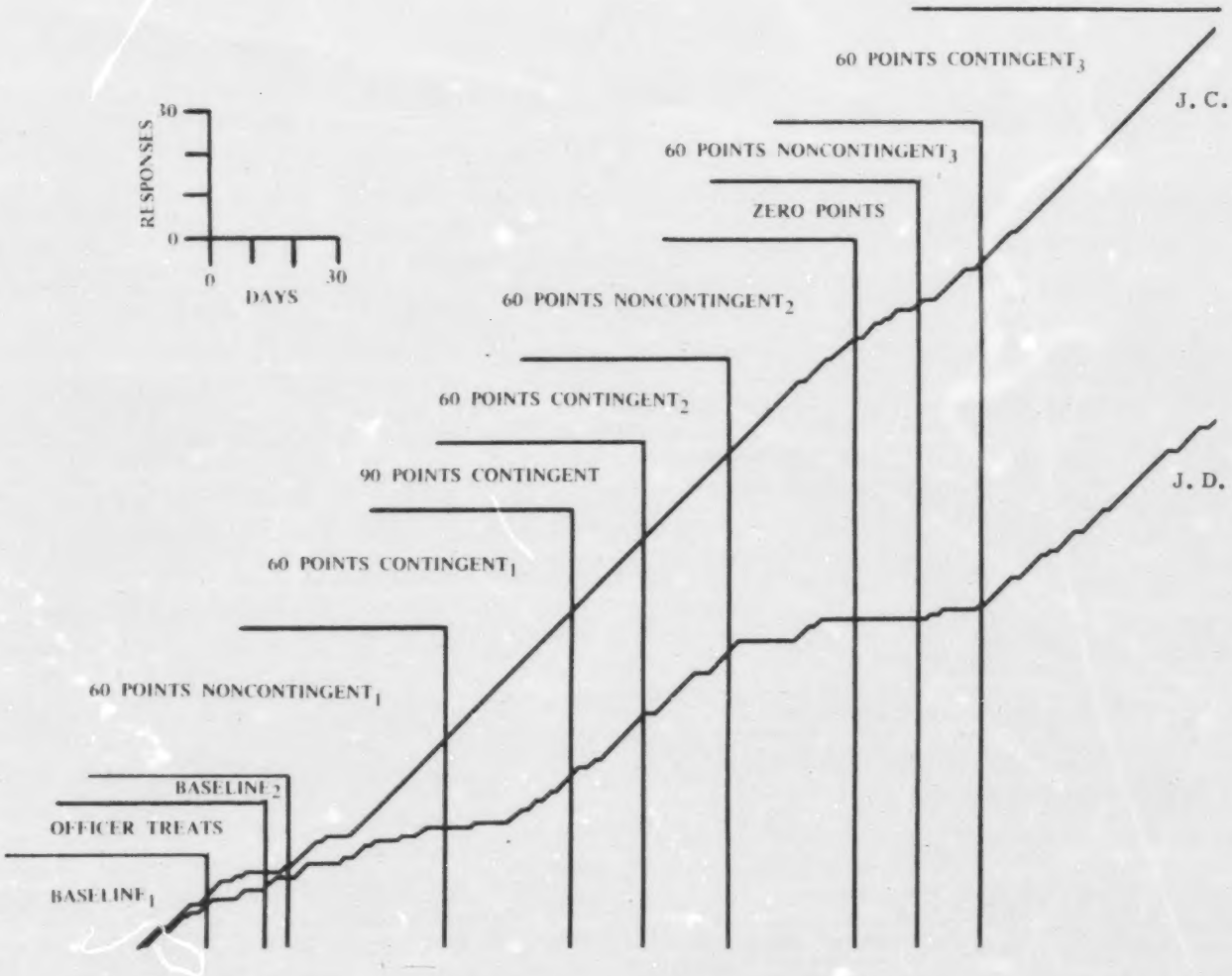

Fig. 9. Representative individual cumulative records of two inmates performing the first morning activity--arising at the prescribed time--under the first eleven conditions of Experiment 1.

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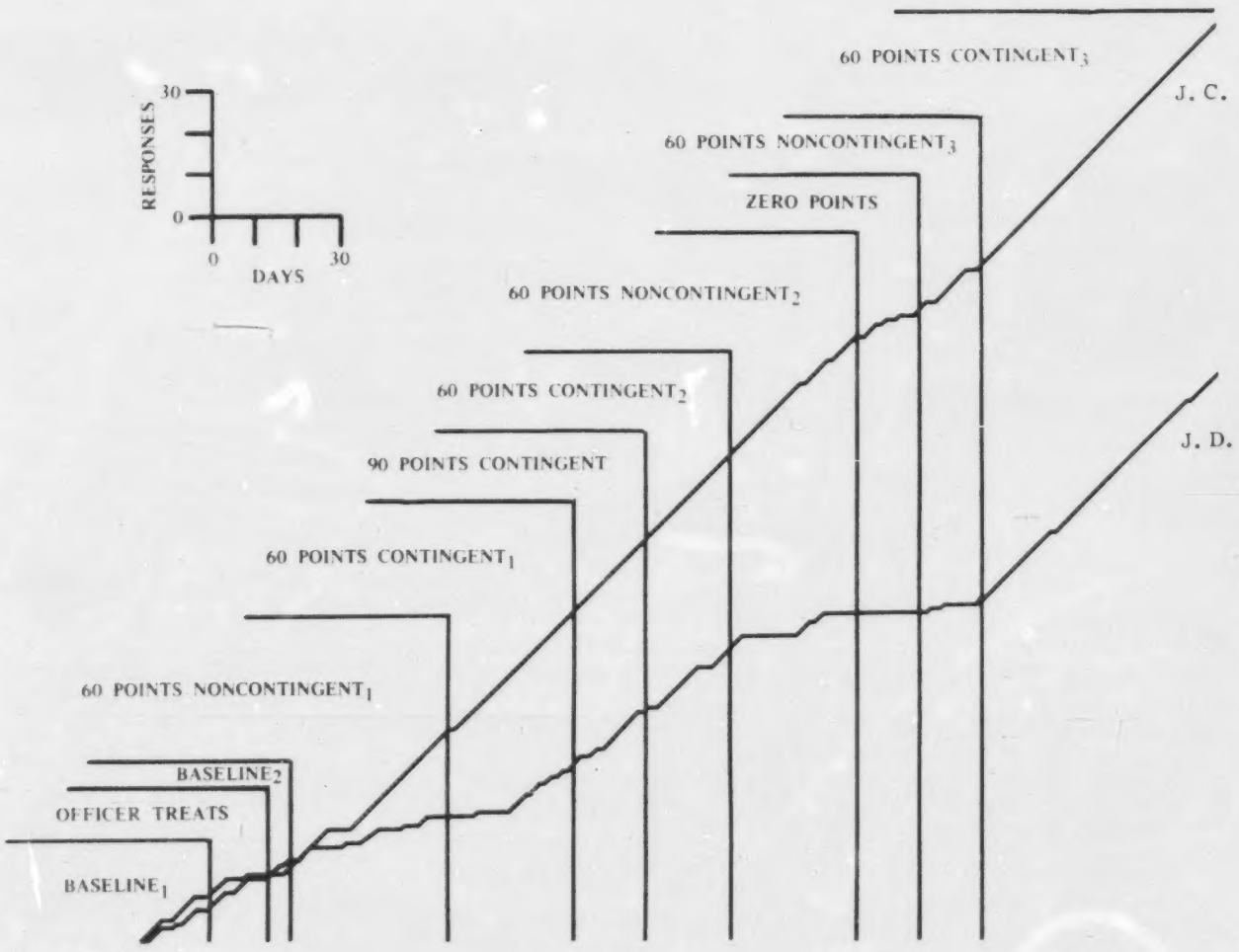

Fig. 10. Representative individual cumulative records of two inmates performing the second morning activity--bed making--under the first eleven conditions of Experiment 1.

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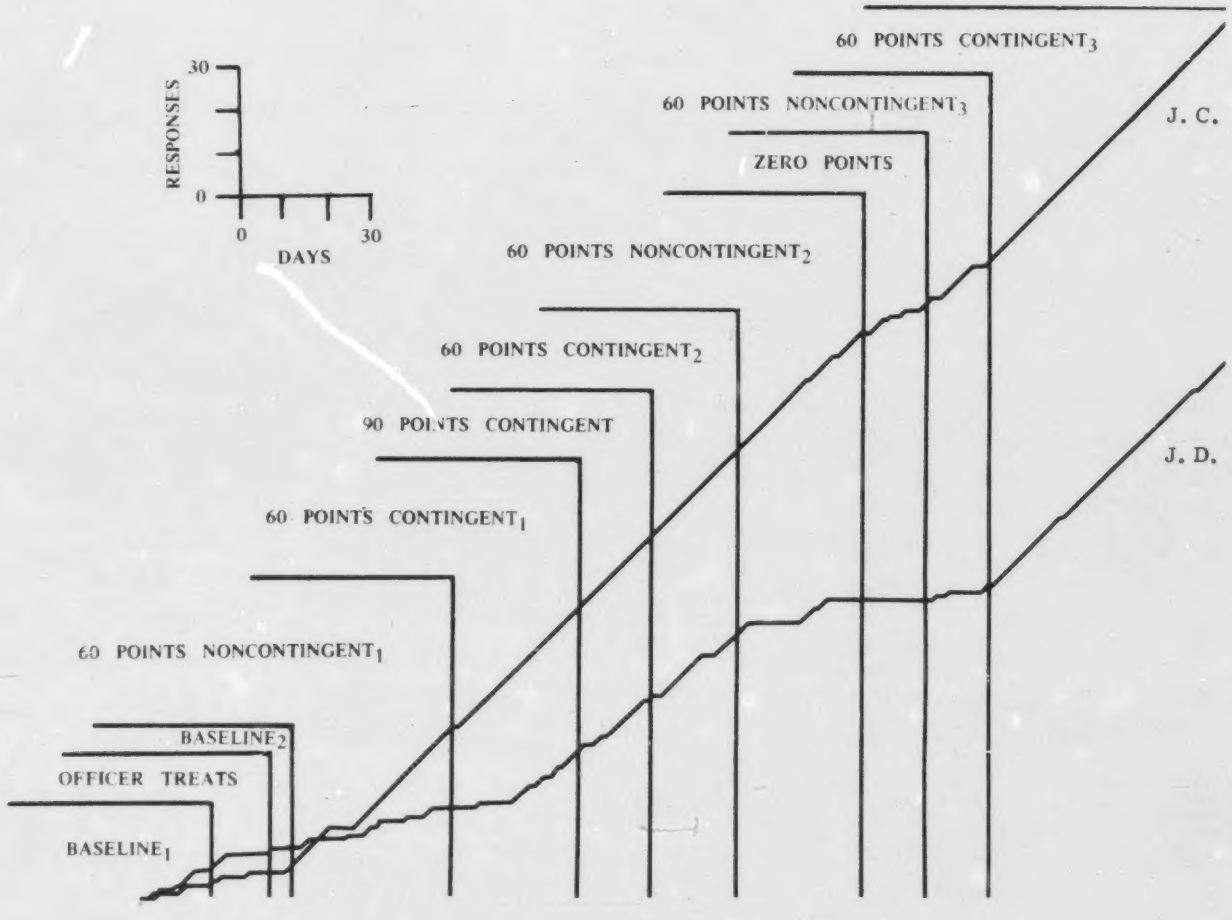

Fig. 11. Representative individual cumulative records of two inmates performing the third morning activity--passing living area inspection--under the first eleven conditions of Experiment 1.

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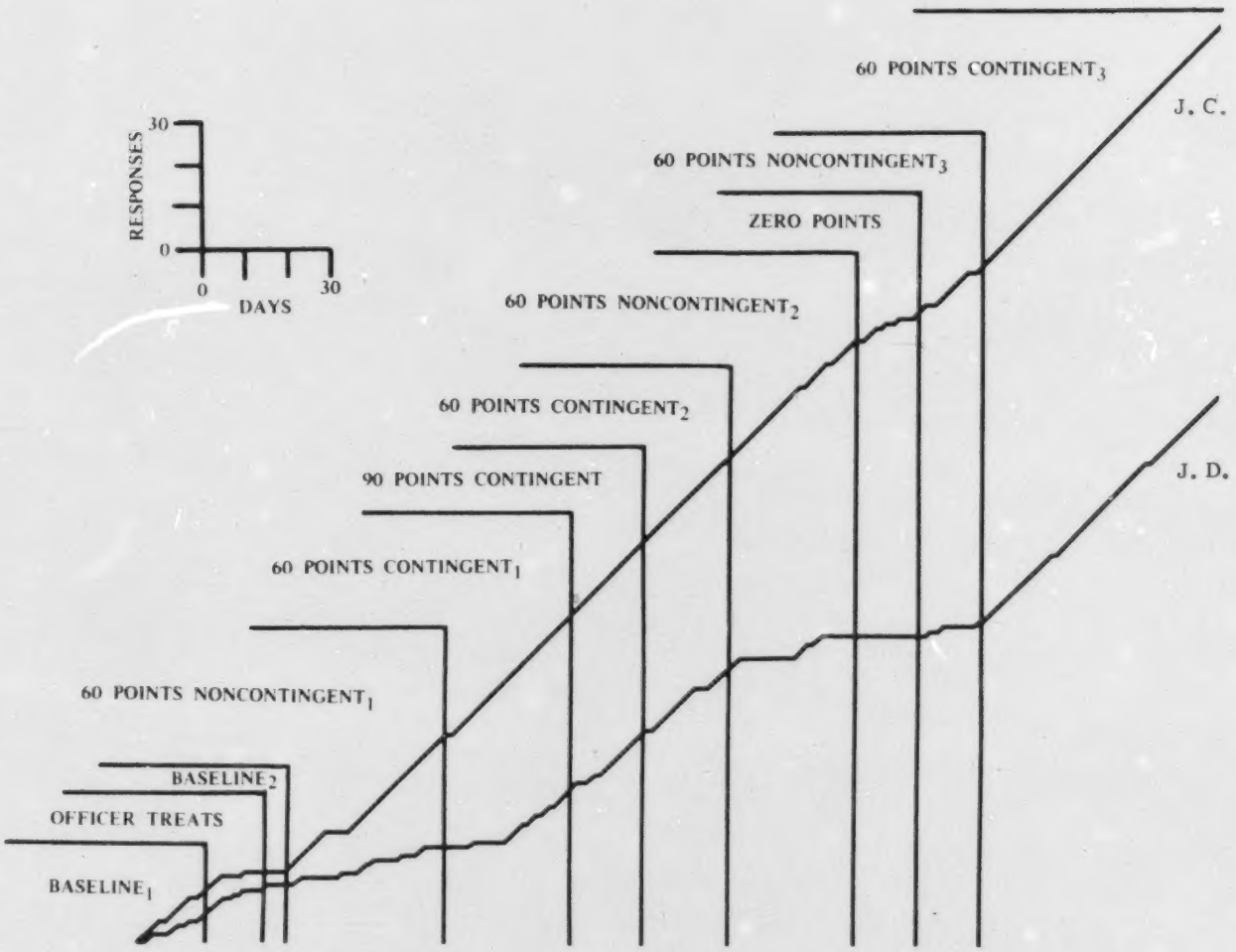

Fig. 12. Representative individual cumulative records of two inmates performing the fourth morning activity–passing personal appearance and grooming inspection–under the first eleven conditions of Experiment 1.

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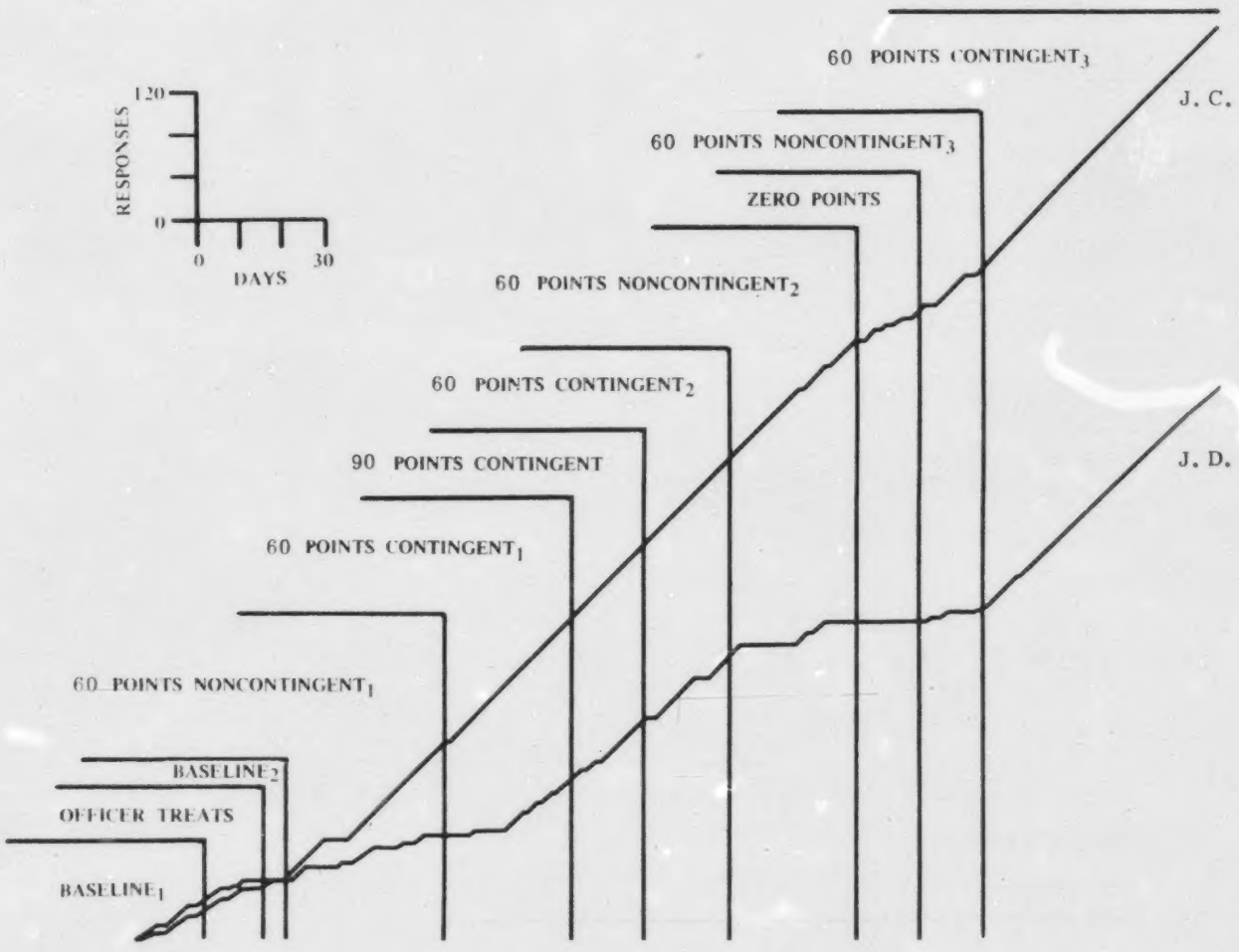

Fig. 13. Representative individual cumulative records of two inmates performing the four morning activities under the first eleven conditions of Experiment 1.

in which these contingencies influenced the performance of the four morning activities is in agreement with that which would be predicted from our basic understanding of the general principles governing behavior. Although the direction of change from contingency to contingency was replicated for each inmate, the magnitude of this change differed from inmate to inmate. However, the performance of even the lowest overall performer, although sometimes irregular, was generally acceptable during those conditions in which tokens were contingent upon the completion of the morning activities. Clearly, then, the group data described previously is only a rough approximation of the effects of these different contingencies of reinforcement upon behavior, for it provides information concerning only the direction of overall change obtained under each condition. It would be inappropriate, therefore, to make the inferential leap from the group data to the behavior of individual participants in order to make statements about the degree to which the behavior of each was affected by the procedures examined here. Such individual statements and predictions are possible, of course, but only following a detailed analysis of each's learning history, competing reinforcement systems, and current levels of behavior.

Discussion

This experiment examined the effectiveness of various token economy procedures in motivating the performance of adult male felons institutionalized in a maximum security correctional institution. Performance-contingent token reinforcement was shown to be considerably more effective in motivating the performance of routine chores of concern to the institution administration than either the social reinforcement conditions of the *Baseline* phases or the coercive procedures of the *Officer Treats* phase. It should not be concluded, however, that social reinforcement alone has no effect, for no attempt was made to evaluate inmate performance in the absence of both social reinforcement and coercive control procedures. It is possible that eliminating the social reinforcement for performance of the morning activities would result in a drop in performance below that observed in the baseline conditions of this experiment. Indeed, this would be predicted to occur. If such a decline in performance was not observed, it would be inappropriate to term the words of praise and encouragement offered by the correctional officer and research staff "social reinforcers." It may be concluded, however, that performance-contingent token reinforcement in conjunction with social reinforcement is a considerably more effective motivator of inmate performance than is such social reinforcement alone.

It should not be concluded that this experiment has demonstrated that the token economy is a more effective motivator of inmate performance than are the aversive control procedures typically employed within the correctional institution, for the correctional officer was prohibited from employing the full range of negative sanctions that he could normally bring to bear to insure the performance of these four activities. The aversive control procedures that have been developed and refined over the years are undoubtedly as or perhaps even more effective than the token economy procedures employed here in motivating inmate performance. However, the token economy is a considerably more effective motivator than is the correctional officer's "best effort" without recourse to the full range of aversive control procedures that would normally be available to him. Additionally, the high levels of performance generated by token reinforcement demonstrate that the token economy is indeed a viable alternative to such aversive control procedures, for it is unlikely that even those procedures could produce much higher sustained levels of performance than were observed during the final period of the token economy.

The impact of increasing the magnitude of token reinforcement by 50% was explored in a partial attempt to determine effective methods of attaining the highest levels of performance possible, and it was found to have no beneficial effect upon the group's performance. This suggests that there is a point of diminishing returns within the token economy at which further increases in the amount of token reinforcement will produce disproportionately small returns in the improvement of group performance. This possibility was explored in detail in Experiment 2.

It should not be surprising that performance deteriorated following the termination of the token economy at the end of the project. Indeed, it would be surprising if the performance of the inmates had continued unchanged, for the power and importance of the contingent relationship between the performance of the four morning activities and token reinforcement had been previously demonstrated by the deteriorations in performance observed during those phases of the token economy in which tokens were either awarded on a noncontingent basis or were not awarded at all. The objective of this experiment was to explore alternatives to existent inmate management procedures, not to develop a regimen wherein the behavior of inmates and/or the correctional staff was changed in a manner that would permit the correctional officer to then maintain the performance of the morning activities in the absence of token reinforcement. This general objective, however, would be warranted for those activities that can be fostered

within the institution and will have impact upon the probability that the released offender will succeed in the community. The scope of this project was limited, however, as it sought only to explore the utility of the token economy as a motivator of (1) behavior required for the day-to-day operation of the correctional institution and (2) performance in programs designed to remediate deficiencies which, if left unchanged, would lessen the likelihood of an inmate's successful reintegration into the community. The former objective has been dealt with within the present experiment and is elaborated upon in Experiment 2, and the latter was explored in Experiments 3 and 4.

EXPERIMENT 2: THE RELATIONSHIP BETWEEN THE MAGNITUDE OF TOKEN REINFORCEMENT AND THE LEVEL OF INMATE PERFORMANCE

One of the contingencies explored in Experiment 1 involved a 50% increase in the magnitude of reinforcement for the performance of the four morning activities. Although it might be assumed that the effect of increasing the amount of token reinforcement contingent upon each member of a group's performance of any particular behavior occurring at less than its maximal level would be an increase in the group's level of performance, this was not observed. The increase in token reinforcement (from 60 to 90 points) for each of the activities had no discernible effect upon the overall percentage of activities completed by the inmates of the token economy cellblock during the 16 days the increased payoff was in effect.

Two possible explanations for the lack of effect are suggested by the relatively high level of performance prior to the increase. Approximately 90% of the morning activities were performed each day during the *60 Points Contingent* conditions that preceded and followed the *90 Points Contingent* condition. It might be that the data collection procedures lack the sensitivity necessary to precisely measure performance and detect relatively small changes at these high levels. Alternatively, the residents of the token economy cellblock may have reached their performance asymptotes under the *60 Points Contingent* conditions, thereby precluding subsequent increases. Neither appears to have been the case, however, for the measuring procedures did detect what appears to be a steadily improving level of performance within this high range during the *60 Points Contingent*$_3$ condition.

A third possibility is that the relationship between the magnitude of token reinforcement and the performance of a particular behavior is not linear and, within reasonable limits, increasing the magnitude of reinforcement produces progressively less increase in the probability that the reinforced behavior will occur. The nature of the relationship between magnitude of reinforcement and response probability was explored in this experiment. The activity chosen as the vehicle for examining the relationship between magnitude of reinforcement and response probability was attendance at the afternoon television news program. Although the behavior chosen for such an evaluation is immaterial from an experimental standpoint, research in an applied setting dictates that the general effect of the research endeavor be, at the minimum, in no way harmful to the target population and, preferably, show beneficial effects.

It has been claimed that one inherent shortcoming of institutionalization is that the inmate fails to keep pace with our culture's continually evolving values and mores, and this, in turn, makes his reintegration into community life that much more difficult when he is eventually released. The mass media in general, and television in particular, appear to have retarded this process. Perhaps even more so than prime time offerings, television news programs and other public affairs and educational offerings present what is most likely the most accurate picture of a changing society and have the greatest potential of keeping the inmate abreast of current events and lessening the cultural gap that separates institution and community life. Although claims concerning the beneficial effects of the mass media have not been validated and may, indeed, be erroneous (e.g., the wide-scale introduction of television in correctional institutions has not been paralleled by a decrease in recidivism), there are no logical grounds upon which to argue that encouraging inmates to avail themselves of this particular aspect of local and network programming is in any way harmful. In fact, it may be in the best interests of all concerned.

Response Definitions

During the period of this project, the local television stations presented the television news weekdays and most weekends for the hour between 5:30 and 6:30 P.M., with the network national news the first half hour followed by the local news, weather, and sports reporting the second half hour. Each day the inmates physically present within the television room were counted at 5:45 P.M., and this number was converted to a percent of the number of inmates on the token economy cellblock census that day. The objective nature of this measure precluded the necessity of reliability estimates.

Five forty-five was selected because by so doing it was possible to reclaim the percentage of inmates attending the television news program under the conditions preceding and following the introduction of the token economy. During that time, the activities of all inmates on the census of the token economy cellblock had been recorded at specified times throughout the day. One of these times was 5:45 P.M., and one of the activities recorded was attending the television news program. Those days on which the television news program was either shortened, presented during another time period, or preempted were excluded from consideration.

Experimental Conditions

All changes in contingencies were announced the evening preceding the day they were to occur, and a memorandum detailing the changes was posted on the token economy cellblock bulletin board.

Baseline$_1$. This period preceded the introduction of the token economy on the token economy cellblock. During this period, a 21-inch color television set located in a darkened room (see Figure 1) containing approximately forty chairs in ten rows of four chairs each was continuously available to the token economy cellblock population on the same basis and in accord with the same informal regulations as in the remainder of the institution. The regulations were: (1) the television set was not to be on prior to 7 A.M. nor later than 10 P.M.; (2) disagreements concerning which program was to be viewed were to be settled by the vote of the majority of the viewers, unless the dispute was between sports and nonsports telecasts, in which case (3) sports telecasts had precedence over all other programming, regardless of the proportion of inmates present expressing a desire to view the nonsports programs. These informal regulations remained unchanged throughout the remainder of this experiment. During this baseline condition and in accord with the general constraints discussed above, inmates of the token economy cellblock had free access to the television room.

Pay 60 Points$_1$. This and the following eight conditions were in force during the course of the token economy. This condition consisted of the procedures that were in effect during the greatest portion of the token economy. The television room was utilized as a reinforcing event area, and inmates were required to expend 60 points to gain access to it for one hour or part of an hour measured from the half hour to the half hour. During this condition, the hour during which the television news program was aired was treated no differently than the hours other forms of programming were offered–i.e., inmates wishing to watch all or any part of the program expended 60 points to do so.

Free$_1$. Under this condition, inmates were allowed access to the television room during the hour of the news program without being required to expend the usual 60 points. Approximately ten minutes before the news program was scheduled to begin, it was announced that the television room was open at no cost to all who wished to enter. Inmates were then able to enter the room at no cost until the end of the news hour, at which time they were again required to expend points in order to gain access. This general procedure was followed throughout the following seven conditions.

Earn 60 Points$_1$. Each day of this condition inmates who attended the entire one-hour television news program earned 60 points that were credited to their point balances. A staff member recorded the names of all inmates present when the news program began and then remained in the room to monitor attendance during the ensuing hour. Inmates were free to leave and reenter as they wished. In order to earn the points awarded for attendance at the news program, however, an inmate was required to (1) be present when the program began and (2) remain in the room for the entire hour that the national and local news programs were on the air. Those who entered the room after the news program began or who left for any period of time while the program was being aired were not awarded the attendance points.

Earn 120 Points$_1$. The procedures followed during this condition were identical to those followed during the preceding condition. However, the magnitude of token reinforcement for attendance at the television news program was double that of the previous condition. Only those inmates present during the entire program earned 120 points.

Earn 240 Points$_1$. The procedures followed during this condition were identical to those of the preceding two conditions. The point payoff for attending the news program was doubled again, with those present during the entire program earning 240 points.

Earn 120 Points$_2$. This condition was identical to the *Earn 120 Points*$_1$ condition.

Earn 60 Points$_2$. This condition was identical to the *Earn 60 Points*$_1$ condition.

Free$_2$. This condition was identical to the *Free*$_1$ condition.

Pay 60 Points$_2$. This condition was identical to the *Pay 60 Points*$_1$ condition.

Baseline$_2$. This condition followed the termination of the token economy. The procedures followed during it were identical to those of *Baseline*$_1$.

Results

The percentages of inmates in the cellblock token economy who were present in the television viewing room at the time of the daily attendance checks during the eleven experimental conditions are presented graphically in Figure 14. The *Baseline*$_1$ and *Ba seline*$_2$ conditions, which represent the levels of performance prior to and following the token economy, are not continuous with the remaining nine conditions, which are continuous with one another and fall approximately within the middle third of the project. Those days are omitted on which the news program was either shortened, presented at a period other than its customary time, or preempted.

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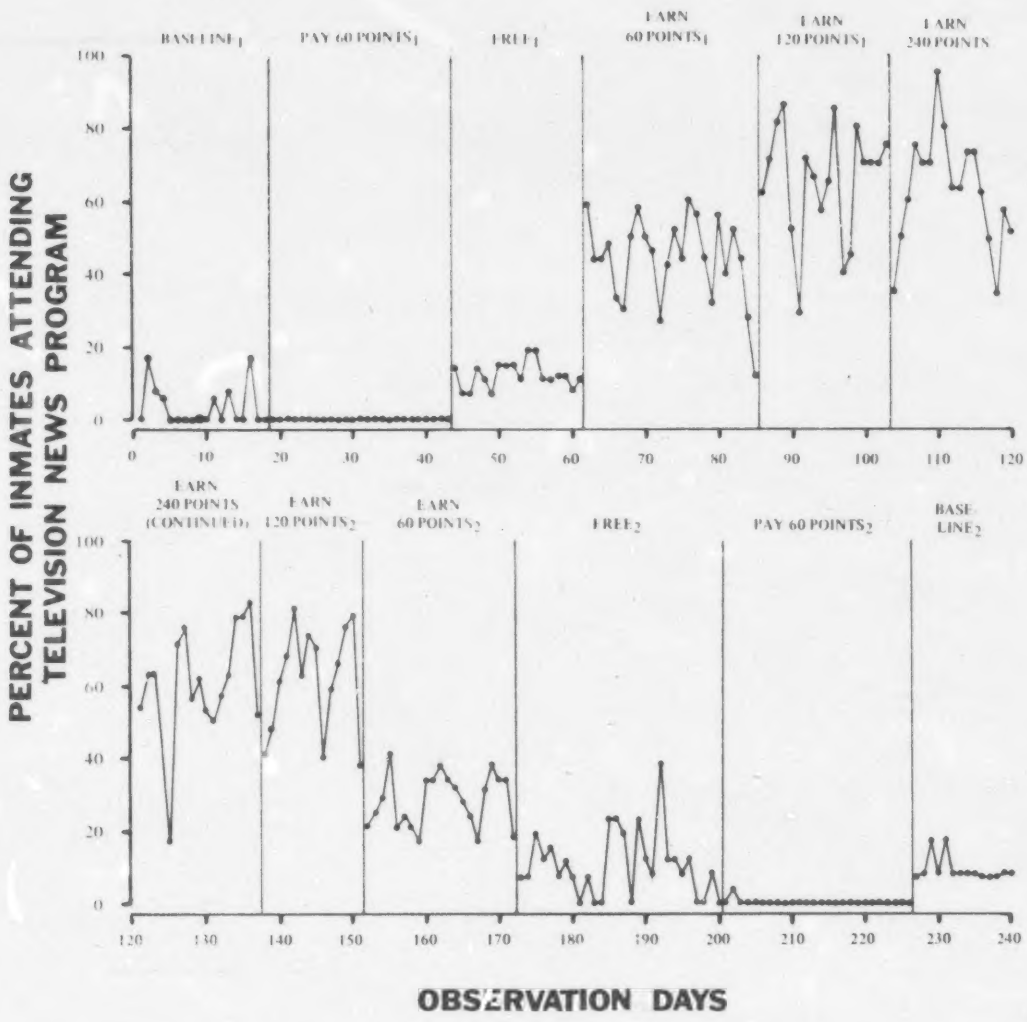

Fig. 14. Daily percentages of inmates attending television news programs under all conditions of Experiment 2.

Baseline$_1$. During the 17 days of this condition, which preceded the introduction of the token economy, a mean of 3.7% of the inmates on the token economy cellblock census were present in the television room at the time of the attendance check.

Pay 60 Points$_1$. During the 25 days of this condition, which consisted of the routine token economy procedure of expending 60 points to gain access to the television room at all times, no inmate was in attendance in the television room during any of the daily checks at the news hour.

Free$_1$. The mean percent of inmates attending the television news rose to 12.2% during the 18 days of this condition, during which there was no point cost charged for admission to the television room during the time the program was on the air.

Earn 60 Points$_1$. During the 24 days of this condition, in which inmates could earn 60 points for attending the entire television news program, the mean percent of inmates in attendance at the time of the daily check increased to 43.8%.

Earn 120 Points$_1$. The mean percent of inmates attending the program rose again to 65.2% during the 18 days of this condition, wherein attendance earned each inmate 120 points.

Earn 240 Points. During the 34 days of this condition, in which the payoff for attendance was again doubled, the mean percent of inmates attending the television news program remained unchanged at 61.2%.

Earn 120 Points$_2$. The mean percent of inmates attending the program again remained unchanged at 61.7% during the 14 days of this condition, wherein attendance earned 120 points–half the payoff of the previous condition.

Earn 60 Points$_2$. During the 21 days of this condition, in which the amount inmates could earn for attending the entire television news program was again reduced by a half, to 60 points, the mean percent of inmates in attendance at the time of the daily check decreased to 28.3%.

Free$_2$. The mean percent of inmates attending the news program fell to 10.1% during the 28 days of this condition, wherein attendance at the news program neither earned nor cost the inmates points.

Pay 60 Points$_2$. During the 26 days of this condition, which involved a return to the routine token economy procedure wherein inmates were required to expend 60 points to gain access to the television room at all times, the mean percent of inmates present in the television room at the time of the daily check at the news hour fell again, to .2%.

Baseline$_2$. A mean of 9.0% of the inmates on the token economy cellblock census were present in the television room at the time of the attendance check during the 14 days of this condition, which followed the termination of the token economy.

A Comparison of Long-Term Participants with Newcomers

As was mentioned previously, the data presented in Figure 14 summarize the performance of all inmates on the token economy cellblock census throughout the course

of this experiment. Midway through the study, 20 inmates, selected from the general institution population and in accord with the procedures detailed in the General Method section, were assigned to the cellblock. The addition of the new participants, which was done to compensate for a gradual reduction in the census due to such things as reassignments by the institution administration, transfers by the Board of Corrections, paroles, and releases following expiration of sentences, offered an opportunity to compare the effects of the levels of token reinforcement explored in this experiment upon the performance of both those inmates who did and those who did not have a relatively long history of participating in a token economy.

The integration of the new inmates into the token economy cellblock was accomplished over a two-day period. On the first day, the procedures of the token economy were explained and each inmate received instruction in how to perform each activity that earned token reinforcement. On the second day, the new inmates were issued checkbooks and began earning points for the performance of the to-be-reinforced activities. During these first two days, the newcomers were allowed free access to all reinforcing event areas, thereby enabling them to sample the bulk of the reinforcers available to the residents of the token economy cellblock. On the third day, the new inmates became full participants in the token economy and, as such, they were required to expend points to gain access to the reinforcing event areas and, for the first time, were able to obtain commodities from the token economy canteen.

On day 114 of the present experiment, the newcomers began earning points for the performance of to-be-reinforced activities, including attendance at the television news program. On that day, there were 18 long-term participants in the token economy (Group A) and 20 newcomers (Group B). The percentages of inmates in Groups A and B who were present in the television room at the time of the news hour attendance check are plotted separately in Figure 15. The levels of performance of the two groups under the various conditions appear remarkably similar. This observation is borne out by a reexamination of the results of the experiment in terms of each group's performance levels.

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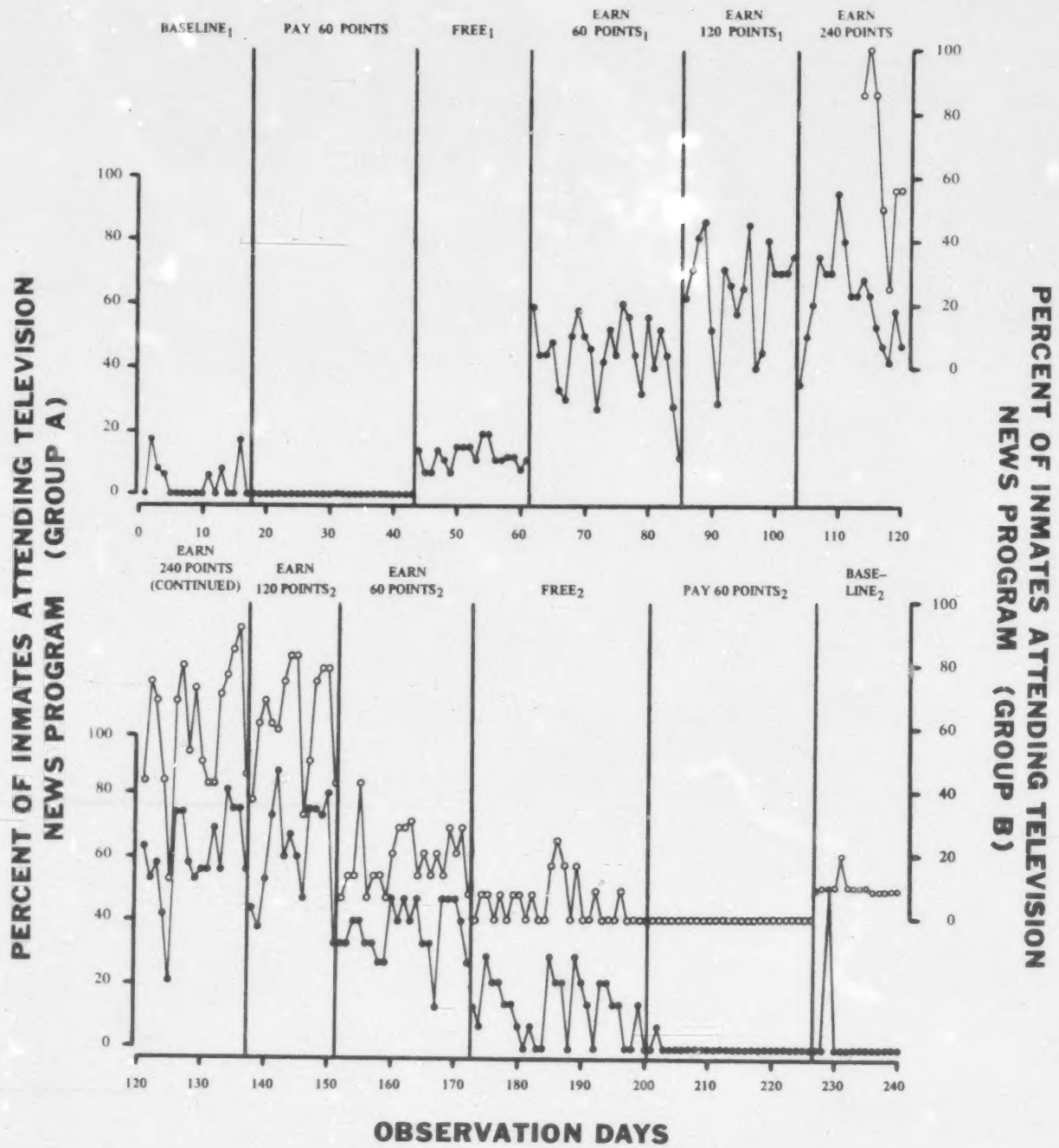

Fig. 15. Daily percentages of two groups of inmates (those present at the initiation of Experiment 2 and new arrivals) attending television news programs under all conditions of Experiment 2.

Earn 240 Points. The mean percentage of inmates in Group A attending the news program under this condition, which provided the highest level of token reinforcement, was 60.6% over the entire 34-day duration. Group B's performance was almost identical to Group A's, even though Group B lacked Group A's general knowledge of the token economy and its experiences with the preceding conditions of the experiment. During the 24 days in which they participated in this condition, a mean of 69.1% of the inmates in Group B were present in the television room at the time of the daily attendance check.

Earn 120 Points$_2$. The performance of both groups was unaffected by this first 50% reduction in the magnitude of token reinforcement. During the 14 days of this condition, the mean percent of inmates in Group A attending the news program was 61.8%, and the mean percent of inmates in Group B attending the program was 63.6%.

Earn 60 Points$_2$. The performance of both groups fell during the 21 days of this condition, in which the magnitude of token reinforcement was again reduced by 50%. The mean percent of inmates in Group A attending the news program fell to 36.9%, while the mean percent for Group B fell even further, to 19.1%.

Free$_2$. The mean percent of inmates attending the news program decreased to 12.6% for Group A and to 5.1% for Group B during these 28 days when attendance at the news program neither earned nor cost points.

Pay 60 Points$_2$. During the 26 days of this condition, in which inmates were once again required to expend 60 points to gain access to the television room, attendance at the news program again decreased. A mean of .3% of Group A and 0.0% of Group B were present in the television room at the time of the daily attendance checks.

Baseline$_2$. This condition followed the termination of the token economy. A mean of 3.57% of Group A and 10.3% of Group B were present in the television room at the time of the 5:45 P.M. check during the 14 days that attendance was recorded.

Individual Performance Records

Examination of the group data suggests that increasing the magnitude of payoff for attending the television news program increased the probability that inmates would engage in that activity. However, the group data does not provide sufficient information to determine whether successive increases in the magnitude of payoff were paralleled by successive increases in the probability that each inmate would attend the news program, or if, instead, the effects were similar to an all-or-none phenomenon, with some inmates beginning to regularly attend the program when 60 points were offered, others beginning

to attend when 120 points were offered, etc. In order to answer this question, individual cumulative records were constructed for the five conditions in which points were awarded to inmates contingent upon their presence in the television room.

Three cumulative records that are representative of the general effects of the various payoff contingencies upon attendance of the television news program are presented in Figure 16. Some inmates, represented by the cumulative record of W. H., began regular attendance when the 60-point payoff was first introduced and continued to attend the news program regularly throughout the following four conditions. Other inmates, exemplified by the cumulative record of M. M., were relatively unaffected by the 60-point payoff, but began to attend the program on a regular basis under the higher payoff (120 or 240 points) conditions. In the case of M. M., attendance was low during the *60 Points Contingent*$_1$ condition, fairly high and regular throughout the *120 Points Contingent*$_1$, *240 Points Contingent*, and *120 Points Contingent*$_2$ conditions, and then low again during the *60 Points Contingent*$_2$ condition. Still other inmates, such as E. A., were relatively unaffected by the contingencies explored in this experiment. Even for these individuals, however, the changes in behavior which did occur, however slight, were most likely to occur when they would be predicted most probably to do so, namely, under the condition offering the maximum payoff for behavior change.

The cumulative records indicate that increases in the magnitude of token reinforcement were more likely to produce all-or-none increases in the performance of each inmate rather than to increase by smaller increments the probability that all inmates would attend the news program. The "thresholds" of the inmates appeared to differ, however, with some inmates responding at low payoff values, others at intermediate payoff values, and still others only at the highest payoff values, if at all. This differential sensitivity to the magnitude of reinforcement is to be expected. It most probably reflects differences in earning and expenditure patterns within the remainder of the token economy.

As in Experiment 1, the similarities in the patterns of responding of even the three seemingly dissimilar examples cited in Figure 16 are more striking than are the differences. Each shows the all-or-none effect of the contingencies upon the target behavior, the stable levels of responding obtained, and the maximum effect under the maximum payoff conditions. Moreover, Figure 16 shows a consistency of responding by the same inmate under the same conditions (i.e., M. M. under the *60 Points Contingent*$_1$ and *60 Points Contingent*$_2$ conditions) despite changes engendered during the intervening conditions.

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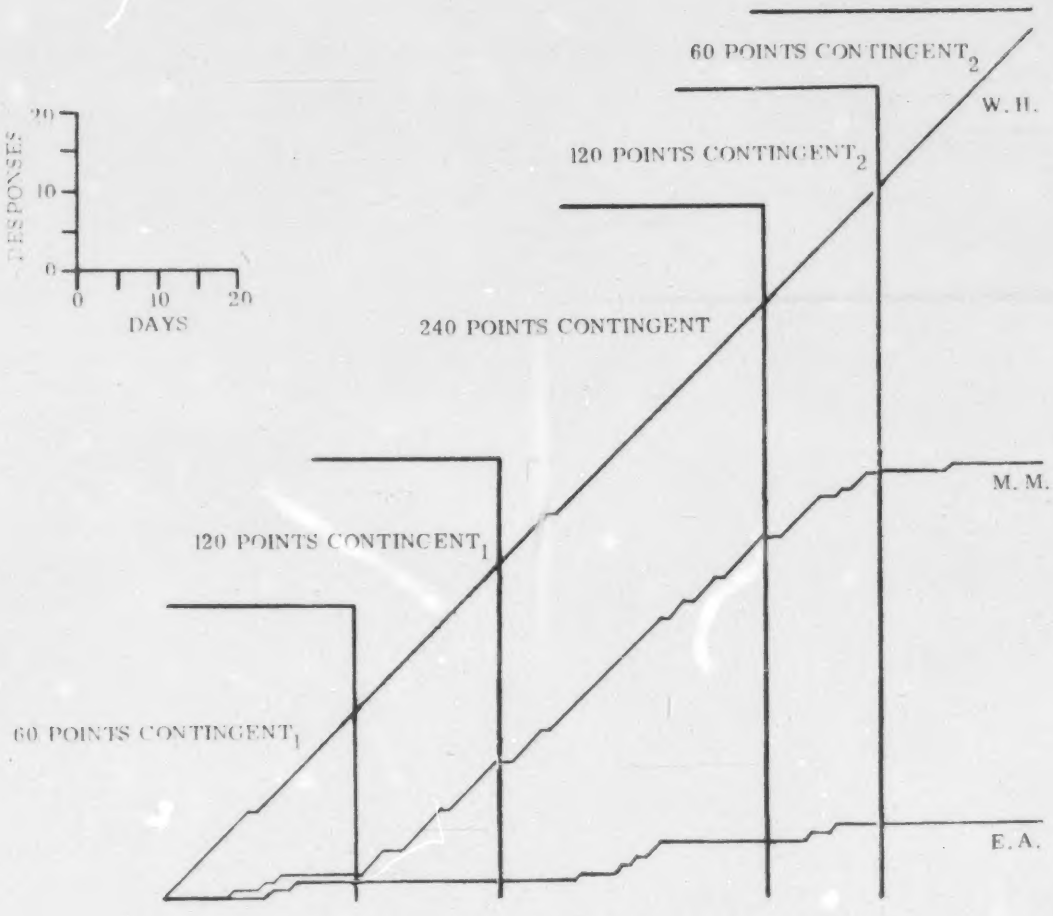

Fig. 16. Representative individual cumulative records of the attendance of three inmates at the television news programs under the five points-contingent conditions of Experiment 2.

Discussion

The results of this experiment support Experiment 1's tentative conclusion that (1) the relationship between the amount of token reinforcement awarded to each member of a group for the performance of a particular behavior and the resulting levels of performance of the group itself is nonlinear and (2) that increasing the magnitude of token reinforcement is effective only up to a specifiable amount. Moreover, it appears that progressively larger amounts of token reinforcement have proportionately smaller effects upon group performance. In this instance, although the level of performance in the *Earn 60 Points$_1$* condition was 3.6 times higher than that in the *Free$_1$* condition, the level of performance in the *Earn 120 Points$_1$* condition was only 1.5 times higher

than under the preceding *Earn 60 Points*$_1$ condition. Similarly, although performance in the *Earn 60 Points*$_2$ condition was 2.8 times higher than that in the *Free*$_2$ condition, the performance under the *Earn 120 Points*$_2$ condition was just 2.2 times higher than in the *Earn 60 Points*$_2$ condition. And performance under the *Earn 240 Points* condition was no higher than either of the two *Earn 120 Points* conditions.

Even though increases in the magnitude of token reinforcement beyond 120 points produced no additional improvements in performance, it should not be concluded that approximately 120 points is the optimum payoff for all activities that might be targeted for reinforcement within this token economy. Undoubtedly, other factors (such as the amount of time and effort required to complete the activity; the presence of competing activities; possible reinforcement by peers or staff for noncompliance; and the nature of the activity itself) influence the relationship between magnitude of token reinforcement and task performance. It is probable, however, that the general shape of the functional relationship relating performance level and payoff value is similar from target behavior to target behavior.

Although the magnitude of token reinforcement was not increased beyond 240 points, it is possible that further increases, to 500 or 1,000 points, for example, might have produced further increases in performance. This possibility was not explored, however, because it would undoubtedly result in an overabundance of points, and this would, most probably, disrupt the performance of other activities considered necessary for the routine operation of the institution by the correctional center's administrative staff.

Although the first solution commonly advanced to solve a performance problem within a token economy typically involves an increase in the magnitude of token reinforcement, these findings indicate that such solutions will frequently prove inadequate. Ideally, each token economy will strive to optimize the magnitude of reinforcement contingent upon each target behavior. This, however, is no easy task, for this value is not only dependent upon the functional relationship between the magnitude of token reinforcement and the performance that is explored in a study, but it also involves a consideration of how increases or decreases in the amount of token reinforcement contingent upon one activity will influence the performance of other targeted activities. Consequently, the "fine tuning" of the token economy requires constant attention to all performance measures as token earning and exchange values are adjusted to identify their optimal value. Even when these optimal values are determined, it is possible that supplementary procedures will be required,

if those charged with the responsibility of directing the operation of the token economy deem additional improvements in performance are important. One such procedure was explored in the following experiment.

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EXPERIMENT 3: THE EFFECT OF A 'LICENSE PROCEDURE' UPON INMATE PARTICIPATION IN A LEISURE-TIME EDUCATION PROGRAM

The low level of academic achievement of the inmates in the token economy cellblock is characteristic of the general population of correctional institutions throughout this country. High or low academic achievement and the possession or lack of a high school diploma or its equivalent are not, of course, primary determinants of success or failure following release, be this indexed by such general indicators as job satisfaction and social adjustment or specific indicators such as number of arrests or conviction for a new felony. They do, however, reflect the presence or absence of skills and abilities that can potentially contribute to the offender's postrelease adjustment; and, by so doing, they have the potential of contributing to a reduction in the likelihood that he will return to illegal activities. The released offender who can read only poorly, if at all, has fewer options available to him than the one who not only reads well but with high comprehension. Similarly, the released offender who can barely perform simple arithmetic, and then with many errors, has fewer options available to him than the one who has not only mastered arithmetic but can also perform algebraic manipulations and solve word problems.

Of course, whether the released offender exercises these potential postrelease options is greatly dependent upon the quantity and quality of assistance and supervision provided to him after his release. Whether or not the offender will possess the skills and abilities necessary to exercise these options is, for most, a function of the prison experience, because the correctional institution is most probably the last opportunity most will have to acquire the skills and abilities that the public school system has failed to provide. Unfortunately, education programs in correctional institutions appear to be faring little better than those of the public school system. Most offenders return to the streets with no better an academic education or with no more marketable vocational skills than they had when they entered the institution.

This is due, in part, to the lack of resources that hallmark corrections in this country. There are too few teachers, too few textbooks, and too few classrooms in virtually all correctional institutions to provide the remedial education services required to remedy the deficiencies of the inmate population. In addition, the inmates of most correctional systems are required to work in the institutions as a means of supplementing the cost of their keep. The inmate is left little time for formalized education programs. Finally,

those who could profit most in such programs often lack the initiative to succeed in a remedial education program. They have a long history of failure in their educative endeavors; the goals toward which they must work are distant; and progress is often painfully slow. Accepting as a given that the acquisition of academic skills could only be of benefit to the inmates of the token economy cellblock, a remedial education program that attacked the difficulties surrounding institutional education endeavors was offered to those who wished to participate in it.

Individually Prescribed Programmed Instruction

Programmed instructional materials were used to maximize the resources of the project. Study schedules for each inmate were provided by the Individually Prescribed Instructional (IPI) System (McKee, 1971). The IPI System, which was developed to facilitate the operation of adult basic education programs, enables a paraprofessional learning manager to diagnose educational deficiencies, to prescribe programmed instructional materials to remediate those deficiencies, and to evaluate student progress throughout the course of the program. The first step in operating the IPI System is to administer the Tests of Adult Basic Education (TABE), a standardized achievement test, and the second step is to diagnose the student's academic deficiencies. When the TABE is scored, each incorrect or unanswered question is recorded on a special form called the "Modular Analysis of Learning Difficulties (MALD)." The completed MALD indicates each area of difficulty and specifies the order in which these difficulties should be remedied.

The MALD also references pages in the *IPI Prescribing Catalog* that list instructional modules to remedy each deficiency. An empirically-derived estimated time of completion (usually between 30 and 90 minutes) is also listed for each instructional module. Materials were selected for inclusion in the catalog after an analysis of a wide variety of commercially available programmed instructional materials, and the catalog is revised as the older materials become outdated and/or more effective materials become available.

To summarize, the IPI System emphasizes the remediation of specific educational deficiencies. Rather than noting that a student is "poor" in fractions and then recommending that he "study fractions," the system enables the instructor to identify those portions of the fractions curriculum that the student has failed to master and then allows the instructor to prescribe for the student just those portions (or modules of instruction) he needs to overcome his deficiency. The end product of the IPI System

is an individualized study schedule for each student that lists, in order, all the instructional modules needed to bring the student up to the 12th-grade level in all areas covered by the TABE.

The remedial education program was offered during the inmates' leisure hours. For most, this was after 4:30 P.M. weekdays and all day Saturdays, Sundays, and holidays. Participation in the education program was encouraged through the medium of the token economy. Typically, inmates earned points equal to twice the empirically-derived estimated time for module completion following their scoring 85% or better on a module test. For example, when an inmate passed the test for a module with an estimated study time of 30 minutes, 60 points were credited to his checking account; and, when the test for a 60-minute module was passed, 120 points were credited to his account. Although participation in the education program was considerably higher during the token economy than preceding it, it was sufficiently low to warrant the examination of alternative incentive procedures. The goal was to encourage inmates to devote approximately eight to ten hours per week to educational enrichment and to pass instructional modules totaling approximately 500 minutes of estimated study time. In addition, the results of Experiment 2 and the need to maintain the performance of other activities on the token economy cellblock indicated that means other than the mere increase in the magnitude of point payoff for the completion of modules should be developed. This, then, was the objective of this experiment, which was conducted during the latter third of the project.

Daily Routine

When an inmate entered the education office, he was provided a time card, given the module of instruction prescribed on his study schedule, and directed to a study room. He used a time clock located there to punch his entry time on his time card. When he wished to take a short break, stop studying for the day, or take an examination, he punched out of the study room and returned the time card and the study materials to the education office. The procedure was repeated when he either returned from the break or again appeared to participate in the education program.

A staff member monitored the study rooms to provide assistance to inmates who were experiencing difficulty and to insure that the times at which inmates entered and left the study areas were systematically recorded. When an inmate completed a module of instruction and was ready to take a test, he was provided with the module test and

directed to the testing room. The test was scored immediately upon its completion, and the date and score were entered on his study schedule. The inmate was then either informed that he passed the module and, during the token economy, awarded the appropriate number of points, or he was informed that the test indicated he needed additional study and was to return to the study room. The routine was then repeated.

Response Definitions

Three measures of inmate participation in the education program were selected for examination, all of which were drawn from the daily time cards and study schedules described above. The first measure was the percentage of inmates on the token economy cellblock participating in the education program each day. The second measure was the average number of minutes all inmates of the token economy cellblock devoted to the education program each day. These two measures were based upon the data recorded on the time cards, with the latter measure *including* those inmates who spent no time in the education program. The third measure was the percent of inmates on the token economy cellblock earning 1,000 points (representing 500 minutes of estimated study time) or more in the education program each week. These data were derived from the information recorded on the study schedule following each module test. This measure most closely reflected progress in the education program, because it is based on an achievement measure (mastery of the material in the instructional modules), while the former two reflect only physical presence in the education area.

Experimental Conditions

Baseline$_1$. This period preceded the introduction of the token economy on the token economy cellblock. The remedial education program and the importance of the skills that could be acquired through participation were explained and discussed with all inmates, and inmates were repeatedly encouraged to participate in the program throughout this condition. Moreover, staff members provided special counseling to all inmates who lacked high school diplomas but had tested grade levels that were relatively high (typically at or above the ninth-grade level). During counseling, the staff emphasized to the inmates that intense preparation during the last months prior to their release could prepare them to pass the General Educational Development (GED) Test and, thereby, earn the equivalent of a high school diploma. In general, every opportunity was taken to encourage all inmates

to partake of the educational curriculum offered them. No other procedures were employed, however, to motivate their performance during this period.

Tokens$_1$. The procedures followed during this condition were in effect throughout most of the token economy. As in the preceding period, inmates were encouraged to participate in the remedial education program. Unlike the *Baseline*$_1$ condition, however, inmates earned points for passing instructional module tests equal to twice the estimated minutes for module completion.

Announce License. On a Sunday evening inmates were informed that, starting a week from the following Monday, they would need an EMLC license if they wished to exchange EMLC points for the backup reinforcers available within the token economy cellblock. Those inmates who did not possess this license would be barred from the reinforcing event areas and prohibited from purchasing items from the token economy canteen. Time off the token economy cellblock would continue as a backup reinforcer, however, but the cost per minute for time off the cellblock would be raised to two points per minute for those who had failed to earn the EMLC license. The cost increase was introduced to maintain the value of the points for those who chose not to participate in the education program, thereby insuring that the performance of other activities that earned token reinforcement on the token economy cellblock would continue little affected by the new procedure. In addition, the retention of time off the token economy cellblock insured that those who did not participate in the education program would not suffer undue hardship. By performing the activities that are generally expected of inmates they would earn more than a sufficient number of points to spend their leisure-time hours in the remainder of the institution, thereby availing themselves of the full range of free-time activities available to the other inmates of the institution, if they so desired.

The EMLC license was earned through participation in the remedial education program. Points continued to be earned by passing module tests, and the earned point value continued to be equal twice the number of minutes estimated for completing the module. The first 1,000 points earned in the remedial education program each week were credited to the purchase of the following week's license; and any points earned in excess of these 1,000 points could be expended within the token economy itself. The cost of purchasing the EMLC license was decreased by 100 points each day of the week--e.g. 900 points Monday, 800 points Tuesday, etc. A license could be purchased at a progressively reduced cost throughout each week. Once a license was purchased, subsequent

point earning were credited toward the purchase of the following week's license until the required 1,000 points were accumulated. Additional earnings in the education program could then be expended in the token economy itself.

Those inmates who purchased a license expended their EMLC points in the same manner that they had prior to the introduction of the license procedure. It was explained that, in most cases, licenses could be earned in less than ten hours of study, and the hours could be distributed over a week's time in any fashion the inmates wished. The importance of the skills taught within the remedial education program was again emphasized. It was made clear to the inmates that choosing not to participate in the education program under the new procedure deprived them of nothing to which the inmates in the remainder of the institution had access. By performing the routine tasks expected of everyone in the institution, they could continue to enjoy the same privileges as their peers in the remainder of the institution. It was also pointed out that the benefits available to the residents of the token economy cellblock were offered in exchange for certain activities on the part of the inmates. The activity that the project staff considered to be of primary importance was self-improvement through education. It was explained that this alone more than justified the new procedure.

License in Effect. The license procedure announced in the preceding condition was put into effect. Those inmates who earned at least 1,000 points in the education program during the week the license was announced were issued the EMLC license on the first day of this period and again following each week 1,000 points were earned. Those who amassed 900 points by a Monday could purchase a license Tuesday; those who amassed 800 points by Tuesday could purchase a license Wednesday, etc.

Announce Termination. On a Sunday evening the inmates were informed that they were beginning the last week during which they would be expected to accumulate points for the purchase of an EMLC license. They were also informed that the week following the coming week was the last week that the backup reinforcers of the token economy would be available only to those who earned a license. Following these two weeks, the licensing procedure was to be discontinued and the conditions in effect prior to the licensing procedure would again be in effect.

Tokens$_2$. The procedures followed during this condition were identical to those followed during the *Tokens*$_1$ condition.

Baseline$_2$. This condition followed the termination of the token economy. The conditions in effect during this period were identical to those in effect during *Baseline*$_1$.

Results

The percentages of inmates participating in the remedial education program each day, the mean number of minutes all residents of the token economy cellblock devoted to the program each day, and the percentages of inmates earning 1,000 points (equivalent to 500-minutes of estimated study time) or more points in the remedial education program each week are presented in Figures 17, 18, and 19, respectively. The *Baseline*$_1$ and *Baseline*$_2$ conditions, which depict performance prior to and following the token economy, are discontinuous with the remaining five conditions, which are themselves continuous and fall approximately within the last third of the period the token economy was in operation.

Baseline$_1$. Participation in the remedial education program was virtually nonexistent during this phase. During the 30 days preceding the introduction of the token economy, a mean of .2% of the inmates devoted any time at all to the program, and the entire resident population spent, on the average, only .2 minutes of study time in the program. No one performed at a level sufficiently high to earn what would be equivalent to 1,000 points, if the token economy were in effect, during any of the five weeks preceding the token economy.

Tokens$_1$. Performance in the education program improved considerably when it earned token reinforcement. During the 32 days preceding the announcement of the license procedure, the percentage of inmates participating increased to 17.5% each day, and the amount of time all residents of the token economy cellblock spent in the program rose to an average of 37.0 minutes per man per day. The percentage of men earning 1,000 or more points in the program each week increased to an average of 18.8% during the nine weeks preceding the announcement of the license.

Announce License. The announcement of the license procedure appeared to have little effect upon inmate performance in the education program. During the week following the announcement, 17.4% of the inmates were involved in the program each day, and all inmates averaged 37.3 minutes of study time per day in the program. Twenty-eight percent of the residents earned 1,000 points that week, thereby making them eligible for full participation in the token economy the whole of the following week.

License in Effect. Participation in the remedial education program increased considerably during the licensing procedure period. During its 63-day duration, the percentage of inmates involved in the program each day averaged 41.9%, and all inmates

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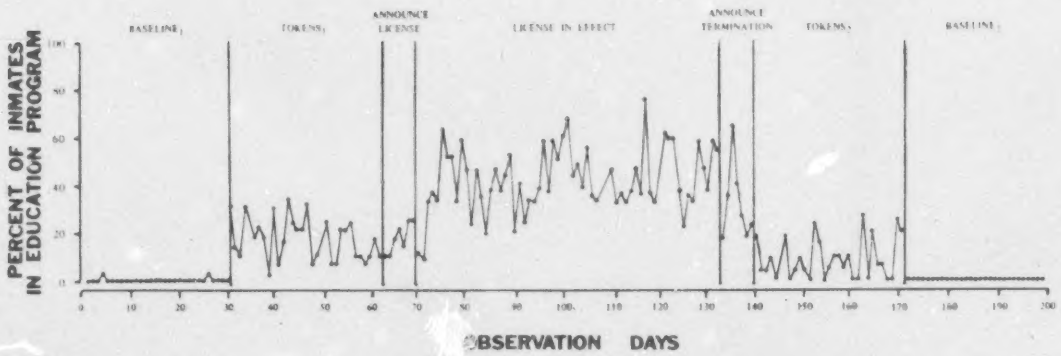

Fig. 17. Daily percentage of inmates participating in the education program under the seven conditions of Experiment 3.

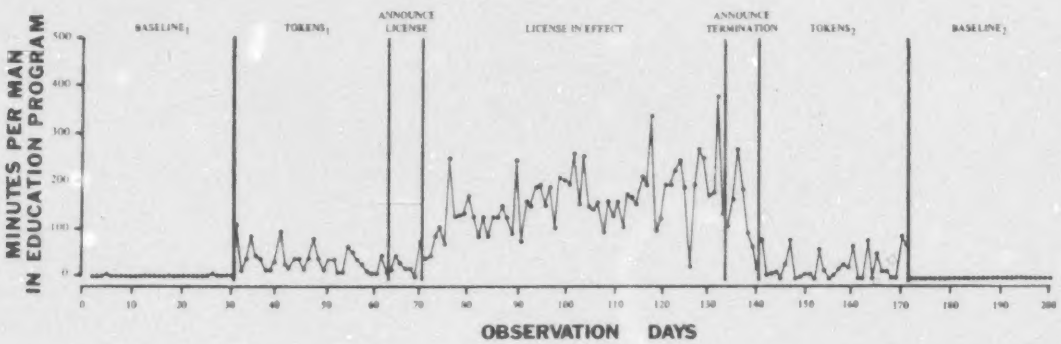

Fig. 18. Average number of minutes per day all inmates spent studying academic material in the education program during the seven conditions of Experiment 3.

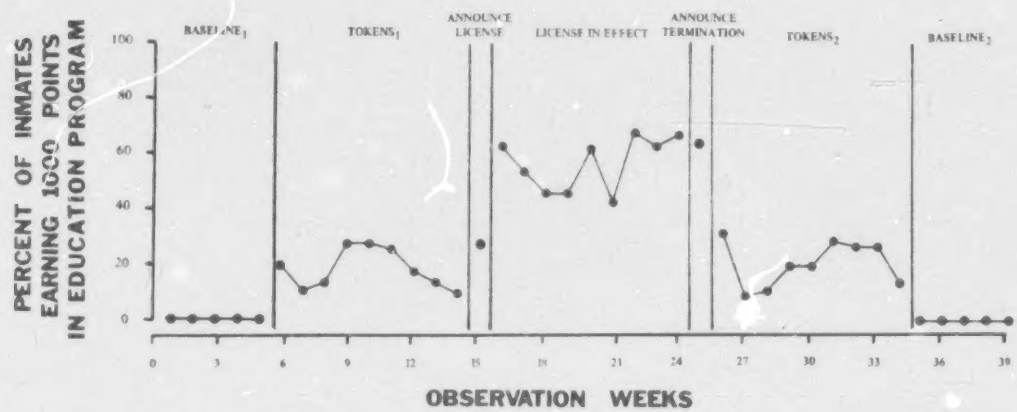

Fig. 19. Weekly percentages of inmates earning one thousand or more points in the education program under the seven conditions of Experiment 3. Although the token economy was not in operation during the Baseline$_1$ and Baseline$_2$ conditions, inmate point earnings were determined on the basis of how many points would have been earned if points were available during these conditions.

devoted an average of 161.8 minutes per day to the program. During these nine weeks, an average of 56.9% of the inmates earned 1,000 or more points each week.

Announce Termination. Performance in the education program declined somewhat during the week following the announcement of the approaching termination of the license procedure and the return to the previous conditions. An average of 32.0% of the inmates were involved in the education program each day of the week, and all inmates averaged 130.0 minutes study time per day in the program. Sixty-four percent of the residents earned 1,000 or more points that final week.

Tokens$_2$. Participation in the program declined markedly during the 31 days following the termination of the license procedure. The average percentage of inmates participating in the program dropped to 8.5% each day, with all inmates averaging only 25.5 minutes per day of study time. The percentage of inmates earning 1,000 points or more each week during the 10 weeks following the end of the procedure dropped to 22.0%.

Baseline$_2$. Performance in the remedial education program ceased completely following the termination of the token economy. Each of the three measures indicated zero participation.

Discussion

The results described above indicate that the license procedure was an effective means of motivating increased participation in the remedial education program. These data do not, however, fully reflect the high level of involvement that emerged. Although less than half the inmates participated in the program on a typical day during the period in which the license was in effect, considerably higher percentages were involved in the program throughout each week. Differing patterns of participation emerged. Some inmates were active in the program early in the week, others late in the week. Some would work in the program for virtually the whole of one weekend day; and others would work for short periods each day of the week. On the average, nearly 60% of the residents of the token economy cellblock amassed 1,000 or more points in the education program each week, thereby earning access to full participation in the token economy the whole of the following week. This, too, is a conservative estimate of total participation. In addition to these, additional inmates earned between 900 and 1,000 points and participated in the full token economy during the last six days of the week. Still more earned between 800 and 900 points and gained access to the full token economy for the last five days of the week, etc.

This experiment also reveals the moderate effectiveness of the token reinforcement procedures employed in motivating performance in the remedial education program. It must be emphasized that the program was conducted during the inmate's leisure time. Most of the residents of the token economy cellblock during the latter third of the project–the period under examination in this experiment--spent their working hours laboring on the institution farm--picking cotton, hoeing weeds, cutting ditch banks, and the like. Others were on road gangs--cutting grass, striping highways, removing litter, etc. Still others worked in such places as the institution kitchen or laundry. Only a relatively small number were involved in formalized vocational training programs offered by either the State of Alabama or the federal government through the U. S. Department of Labor's MDT Project. Within this context, the performance observed during the token reinforcement procedure in the absence of the licensing condition is encouraging, with inmates averaging approximately one-half hour each day in the education program. Moreover, an average of approximately 20% of the inmates performed at levels sufficiently high to earn 1,000 or more points each week; and this represents passing tests on material requiring, on the average, one hour or more of study each day of the week.

It is surprising, however, that virtually none of the residents chose to participate in the remedial education program prior to and following the token economy. Despite the demands of their institutional work assignments, it is difficult to understand why none of the inmates came forward to take advantage of the education program offered to them during their leisure time, especially in light of the special effort the project staff made to encourage them to do so. One would think that some would tire of the dull routine of institutional life and devote some of their evening or weekend hours to the education program, if for no other reason than to break the monotony, much less to better prepare themselves for the period following their release. Unfortunately, this did not happen. Additional incentives were clearly required to motivate participation.

EXPERIMENT 4: A COMPARISON OF THREE FORMATS FOR THE PRESENTATION OF PROGRAMMED INSTRUCTIONAL MATERIAL

It was demonstrated in Experiment 3 that token reinforcement was effective in motivating inmate performance in a remedial education program. In Experiment 4, the reinforcing power of the tokens was utilized to evaluate alternative procedures for presenting educational material to residents of the token economy cellblock. The objective of the experiment was to determine which of three formats for the presentation of programmed instructional material would generate the highest levels of student performance during study and testing sessions. This experiment compared the traditional programmed textbook format to a mechanical presentation procedure (teaching machine) and to material presentation by an individual tutor. The latter format was of particular interest because it explored the feasibility of employing educationally advanced inmates in the education of their peers. If proven efficient this would verify inmate manpower as a valuable source for correctional educators.

Skinner (1954) is credited with the development of the widely used linear programmed textbook in which a question frame, consisting of a question or an incomplete sentence, is printed separately from a frame which provides the answer. When studying a programmed textbook, students usually work alone and at their own pace, making a written response to the question frame and then checking this with the correct response in the answer frame. As was described in Experiment 3, the Individually Prescribed Instructional (IPI) System prescribes units of linear programmed material to remediate specific math and language deficiencies. Performance tests, keyed to the programmed material, determine the students's mastery of a unit of information. The IPI System emphasizes indiv dualized, self-paced instruction, which, when coupled with contingency management procedures, has been demonstrated to generate high levels of student performance (Clements & McKee, 1968).

The teaching machine, an alternative format for presenting programmed instructional material, is also a Skinner development. A principal advantage of the teaching machine is that it enforces the requirement that a student respond to a question frame before going on to the answer frame, thus eliminating the possibility of "cheating" by reading the answer frame before constructing and writing an answer. By so doing, it insures that the student will receive immediate feedback on his actual progress and allows the learning

manager to record the accuracy of the student's performance. It has been suggested that teaching machines may hold the interest of the student longer and provide a greater incentive for accuracy than the programmed textbook.

The third material presentation format is an extension of the concept of the teaching machine. Here individual tutors present the programmed material and explain troublesome points to the students. This technique appears to have all the advantages of the teaching machine, while at the same time providing a high level of individual attention. Some investigation of the use of tutors in programmed courses in higher education dealing with relatively complex concepts has been conducted (Keller, 1969; Johnston & Pennypacker, 1971). It is possible that tutoring by educationally advanced inmates might hold the interest of the inmate students even longer than the teaching machine and also stimulate improved performance.

Participants

Nine students of the token economy cellblock served as students in the experiment, and eight of their peers served as tutors. Students were volunteers who had progressed sufficiently far in their IPI prescriptions to make them eligible for the programmed course. Tutors were selected from resident volunteers who had previously completed the programmed course.

Response Definitions

The indicators of the effectiveness of the three presentation formats were three performance measures taken (1) during the study session for each chapter, (2) during a performance test scheduled 24 hours after the chapter was studied, and (3) in a performance test scheduled 7 days after the chapter was studied. The time required to take each of the two performance tests was recorded. Using the study session and performance test times, measures of rate of study (number of question frames completed divided by study time) and rate of correct responding on performance tests (number of correct test items divided by testing time) were computed.

Experimental Conditions

The same academic material was used in all three presentation formats. All students studied the commonly used programmed English course, *English 2600*. The linearly programmed textbook material was adapted for use in the teaching machine and tutoring

formats. The course consists of 69 chapters of approximately equal length (about 38 question frames per chapter). The students studied the first 60 of these chapters, with each student using each of the three formats for 20 chapters. The sequences in which the students experienced the three presentation formats were counterbalanced to control for the possibility of order effects. Both students and tutors received token economy points for their participation in the experiment. One chapter was studied each night until all sixty chapters had been completed. In this experiment, the student and the tutor received 120 points each for the completion of a chapter, independent of study time or test performance.

Textbook. In the traditional textbook mode, students were issued a textbook and instructed to study the material, responding to each question frame (either overtly or covertly) before turning to the answer frame. As in the classroom use of programmed materials, there was no way to ascertain whether or not this was done. Students were instructed to go to the tutors or to the project staff members for assistance if they could not understand a section.

Teaching machine. In the teaching machine format, the question and answer frames were cut from the textbook and taped into continuous rolls, one roll for each chapter. A machine was constructed that permitted the student to see one question frame at a time and to write his response. After the student wrote his response, he advanced the roll to see the answer frame and to compare his response to the correct answer. Because the machine would not reverse, he could not change his answer. Students were required to respond to each frame, and their responses were checked subsequent to each study session to record errors and to make certain they were consistently responding.

Individual tutor. For the tutoring mode, the textbook frames were cut apart and pasted on 3" x 5" index cards, with the question frame on the front of the card and the answer frame on the back. This allowed the tutor to present the question frame to the student, ask for a verbal response, and then show him the answer frame. Tutors were directed to explain incorrectly answered frames to the student in as much detail as they deemed necessary to ensure the student understood both why his response was incorrect and what the correct answer was.

Results

Data are presented for seven students who completed the course. The collection of data was supervised by project staff members who frequently substituted for the tutors

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in order to verify the recorded performance of the students. A summary of the study and testing performance measures is presented in Table 7. As indicated in Table 8, the analysis of variance reveals that there was a significant difference in the rate of studying programmed material among the three presentation formats. The Duncan Multiple Range Test (Winer, 1962) indicates that the individual tutoring procedure produced higher study rates than either the programmed textbook ($p < .05$) or teaching machine procedures ($p < .05$), which did not differ from each other ($p > .05$).

TABLE 7

Performance Measures in Three Programmed Instruction Presentation Formats

	Programmed Textbook	Teaching Machine	Individual Tutoring
Study rate	2.52	2.33	3.04
Percent correct -- 24-hour retention	89	89	89
Percent correct -- 7-day retention	86	88	85
Rate correct -- 24-hour retention	2.81	2.80	3.12
Rate correct -- 7-day retention	2.65	2.92	3.10

TABLE 8

Analysis of Variance for Rate of Studying Programmed Material Across Three Presentation Formats

Source	SS	df	ms	F
Total	9.50	20	----	----
Subjects	5.15	6	----	----
Presentation formats	1.90	2	.95	5.28*
Error	2.45	12	.18	----

*$p < .06$

Analysis of variance of the performance test data failed to reveal any significant differences among the material presentation procedures on either test score (Table 9) or rate of correct responding on performance tests (Table 10). Students scored significantly higher on the 24-hour retention tests than on the 7-day retention tests. There were no significant differences among the rates of correct responding under the three presentation formats, although that under the individual tutoring condition was somewhat higher than that for the two other presentation formats.

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TABLE 9

Analysis of Variance for Score on Performance Tests
Across Three Presentation Formats and Two Retention Intervals

Source	SS	df	ms	F
Total	3,528.0	41	----	----
Subjects	3,116.9	6	----	----
Presentation formats	5.8	2	2.9	.20
Retention intervals	89.8	1	89.8	6.75*
Presentation formats X retention intervals	9.3	2	4.7	1.09
Error presentation formats	174.3	12	14.5	
Error retention intervals	80.0	6	13.3	
Error presentation formats X retention intervals	51.9	12	4.3	

*$p < .05$

TABLE 10

Analysis of Variance for Rate of Correct Responding on Performance Tests
Across Three Teaching Procedures and Two Retention Times

Source	SS	df	ms	F
Total	10.125	41	----	----
Subjects	3.815	6	----	----
Presentation formats	1.041	2	.521	1.94
Retention intervals	.003	1	.003	.01
Presentation formats X retention intervals	.133	2	.067	.47
Error presentation formats	3.225	12	.269	
Error retention intervals	.208	6	.035	
Error presentation formats X retention intervals	1.700	12	.142	

*$p < .05$

The three materials presentation formats were also compared on the basis of the number of students who had higher rates of correct responding on the majority of module tests. This comparison indicated that a majority of the students had their highest rates of correct responding with the tutoring format. This rate superiority held for both short- and long-term retention tests, with the binomial test revealing statistically significant test rate differences between the tutoring format and the programmed textbook ($p < .05$) and teaching machine ($p < .05$) formats. The difference between the latter two formats failed to reach significance ($p > .05$).

Discussion

In this experiment, token reinforcement was used to reward participation in an experiment designed to evaluate three methods of presenting programmed instructional

material. When students studied material with individual tutors they completed their study of a unit of material more quickly than they did when studying with the other two formats. A possible explanation for this difference is that it is an artifact of the procedure employed. The only activity required of the student in the individual tutor presentation format was to emit a verbal response to the question frame. In apparent support of this explanation, the format which required the most activity on the part of the student–the teaching machine format–tended to have the lowest study rates. Students tended to have higher rates of correct responding on more modules after individual tutoring than after the other presentation formats, but no difference was found in testing performance among the three presentation formats in terms of percent correct and rate of correct responding on either the 24-hour or 7-day retention tests.

In summary, the study failed to confirm the presence of a consistent superiority of either the teaching machine or the individual tutoring formats over the traditional programmed textbook routine. Other differences, however, should be considered in terms of their practical utility. One difference between the presentation formats not discussed previously is the obvious disparity in program cost. The cost of using individual tutoring or the teaching machine would be far greater than that of using the traditional programmed textbook. It is therefore meaningful from a cost-effectiveness point of view that performance using the programmed textbook alone is comparable to performance in the other two presentation formats.

A possible explanation for the lack of any clear differences involves the nature of the to-be-mastered subject matter. The material taught was basic grammar and punctuation, and, as such, it presented concepts that were relatively simple. Inmate tutors may be more effective when working with subject matter that is more subtle and difficult to conceptualize. It does appear, however, that the programmed textbook is an economical and efficient format for the presentation of material typically offered in adult remedial education classes such as the one operated in this project.

EXPERIMENT 5: DECREASING UNDESIRABLE BEHAVIOR THROUGH THE REINFORCEMENT OF AN INCOMPATIBLE OPPOSITE

Experiment 3 explored an alternative to increased token reinforcement as a means of fostering a desired activity. This experiment explored an alternative to an increased response cost (fine) as a means of reducing an undesired activity–that of departing the token economy cellblock without recording the departure time on the time card provided. A time clock and time card rack were located adjacent to the entrance/exit of the token economy cellblock. Each morning a time card for each inmate was placed in the card rack, and inmates were expected to record the times at which they left and returned to the token economy cellblock throughout the day. At the end of each day, the number of minutes each inmate had spent off the cellblock during the hours of operation of the token economy were computed and charged to his checking account.

A staff member made aperiodic rounds of the cellblock, recorded the names of the inmates present, and checked them against the time cards. If an inmate was identified as having departed the token economy cellblock without recording his departure time, the staff member entered the last time the inmate could be identified as being present on the token economy cellblock on the card in the space in which the departure time should have been recorded. This time was either the time of the preceding attendance check or the last time at which the inmate had recorded his return to the cellblock, whichever was the most recent. The interval between then and the time of his return was included in the total time charged to him for being away from the cellblock. This procedure invariably resulted in the expenditure of more points for each detected violation than if the established procedure had been followed.

The time clock violations described above appeared, in general, to be acts of commission rather than acts of omission. When confronted, the violator typically offered no excuse and, when pressed, explained that the staff failed to detect the majority of his violations and that, in the long run, the violators were coming out ahead of those who followed the prescribed procedure. That is, by slipping off the token economy cellblock for short periods of time without punching out, they were saving more points than were being charged to their accounts when their violations were detected. Indeed, the entire matter took on the characteristics of a game between inmates and staff, with the inmates attempting to judge whether or not an attendance check was imminent and

the staff attempting to increase their unpredictability in order to detect as many violations as possible.

A number of procedures were considered to reduce the number of time clock violations. The simplest was to increase the frequency of attendance checks, thereby detecting a greater portion of the violations and, hopefully, making repeated violations more costly than following the established procedures. This procedure was not feasible, however, for the staff had additional duties that would suffer if it was followed. A second possibility was to leave the frequency of attendance checks unchanged but to increase the costs of detected violations. This alternative was not adopted either, primarily due to the staff's general preference for a positive reinforcement strategy rather than a punitively oriented response cost procedure. Rather than examining the effect of increasing the response cost for violations of the time clock rule, it was decided to assess the feasibility of reducing the number of violations through the reinforcement of behavior that was incompatible with the commission of violations, and to employ in this the same reinforcer that was assumed to be maintaining the rule violations.

Response Definition

The definition of the time clock violation was unchanged: Any inmate who was identified during an attendance check as having left the token economy cellblock without punching the departure time on his time card during the hours the token economy was in operation was charged with a violation. An inmate could accumulate any number of violations each day. The total number of violations detected was determined for each day. This value was then converted to a rate measure by dividing it by the number of inmates on the token economy cellblock census that day and then dividing the resultant value by the number of hours the token economy was in effect that day. This transformation compensated for fluctuations in daily census and allowed comparisons between weekdays, during which the token economy was in operation for seven hours, and weekends and holidays, during which the token economy was in operation sixteen hours each day.

Prior to this experiment, the instructions to staff concerning the performance of attendance checks stated only that they were to perform an unannounced check on the average of every 30 to 45 minutes. In order to both insure that checks were made and to increase their unpredictability, the attendance check procedure was formalized in this

experiment. An interval timer was made available and each of the seven 10-minute increment values between 0 and 60 minutes, inclusive, was recorded on a separate card. At the start of each shift, the staff member responsible for the token economy cellblock was to perform an attendance check, record the violations detected, shuffle the seven cards, select one, and set the interval timer to the value prescribed by the selected card. The timing-out of the timer signified another check was due, and the procedure was repeated. If the card bearing the zero value was selected, a check was performed immediately. This procedure insured that attendance checks were virtually unpredictable by the inmates, were systematically conducted by all staff members, and performed, on the average, every 30 minutes throughout each shift.

Experimental Conditions

Baseline$_1$. The formalized data collection procedures described above were implemented on the first day of this condition and continued through the entire second phase and first half of the third phase of the experiment. The steps followed when an inmate was detected in violation of the policy concerning leaving the token economy cellblock were unchanged. As was described above, when an inmate was identified as having left the cellblock without recording the departure time on the time card provided for this purpose, the staff member detecting the time clock violation entered the latest time the inmate could be identified as having been present on the unit. The inmate was then charged, at the standard rate of one point per minute, for the time between then and the time at which he returned. At the end of each day, the total number of points each inmate expended to gain access to the remainder of the institution was deducted from his checking account balance.

Correction. The same method of dealing with detected violations and the same data collection procedures were used in this period as were used in the preceding condition. However, a procedure that provided reinforcement to those who regularly recorded their departure times was introduced. Reinforcement consisted of time off the token economy cellblock at no charge, the same activity that was assumed to be maintaining rule violations. Beginning on each Sunday and continuing through the following Saturday, inmates earned one-half hour of free time off the cellblock each day that they recorded all their departure times. These half hours were accumulated and could be used as the inmates wished on the following Sunday. The attendance checks determined who did and did not earn the

half hour of free time each day. Those who went the entire day without accruing a time clock violation were considered to have recorded all their departure times that day. Those who were identifed as having left the cellblock one or more times on a particular day failed to earn that day's free half-hour. A record was posted on the cellblock bulletin board, and a cumulative total of the free time earned was maintained throughout the week for each inmate.

Baseline$_2$. The procedures followed during the first 14 days of this condition were identical to those followed during the *Baseline*$_1$ condition. Beginning on the 15th day, the formalized recording procedure util.zing the interval timer and randomly selected intervals between attendance checks was discontinued. The project staff was instructed to return to the original procedure and again perform attendance checks on the average of every 30 to 45 minutes, as they saw fit. Probes were conducted on days 21, 26, and 34 of this condition, during which the formalized data collection procedure of the correction condition was again employed in order to obtain an estimate of the longer-term effect of the *correction* procedure.

Results

The daily time clock violation rates under the conditions of this experiment are presented in Figure 20. As was indicated above, the rate measure was computed each day by dividing the total number of detected violations by the number of inmates on that day's token economy cellblock census and then dividing the resultant value by the number of hours the token economy was in operation. Again, this was done to control for variations in the size of the census and the amount of time during which attendance checks were being performed. If, for example, there were a total of 10 violations on a particular day, there were 20 inmates on the cellblock census, and attendance had been checked regularly over a 7-hour period, the violation rate would be .071.

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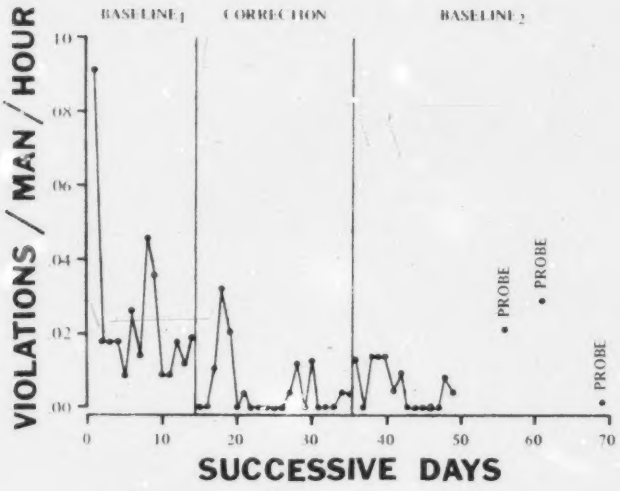

Fig. 20. Daily time clock rule violation rates under the three conditions of Experiment 4.

Baseline$_1$. The mean violation rate during the 14 days of this condition, in which the formalized attendance check procedure was instituted, was .025. However, inspection of Figure 20 reveals that the first day the formalized attendance check procedure was in effect the violation rate was markedly higher than during the following 13 days. When this aberrant data point is dropped, the mean violation rate for the remainder of the period decreases to .018.

Correction. During the 21 days of this condition, in which reinforcement was contingent upon behavior incompatible with time clock violations, the average violation rate fell to .007, less than half that of the preceding phase. In addition, the highest rates of violation occurred during the first week of this condition. Only twice during the last two weeks of this condition were the highest violation rates equal to or greater than the lowest violation rates of the *Baseline*$_1$ period.

Baseline$_2$. Initially, the return to the procedures in effect prior to the correction phase had virtually no effect upon the violations committed by the residents of the cellblock. The mean violation rate during the first two weeks of this condition was .006. However, the mean violation rate during the three probes was .017, more than twice that recorded during the first two weeks of the present condition and approximately the same

as that of the *Baseline*$_1$ condition, suggesting a tendency for the violation rate to approach that of the period preceding the correction phase.

Discussion

The results of this experiment reveal the effectiveness of a procedure utilizing the principle of the reinforcement of incompatible opposites in reducing the rate of occurrence of an undesirable behavior on the token economy cellblock. The rule violation rate under the condition in which compliance was reinforced was approximately one-third that observed prior to its implementation. Although there was no increase during the two weeks following its termination, the effects of the reinforcement procedure do not appear to have been irreversible. The violation rate during the unannounced probes following this two-week period was comparable to that recorded prior to the implementation of the correction procedure. Though no firm conclusions can be derived from so few data, the data do suggest that an increase in violation rate took place following the termination of the formalized attendance procedure.

The formalized attendance procedure itself appears to have some effect upon the time clock violation rate. The extremely high violation rate recorded during the first day of the *Baseline*$_1$ condition (the first day the formalized attendance procedure was used), in comparison to the remaining 13 days of the phase, suggests a reduction in the violations committed by the residents of the token economy cellblock under the conditions of the procedure alone. It is likely that the attendance checks by the staff were inconsistent prior to the institution of the formalized attendance check procedure, and the reduction in violation rate suggested during the *Baseline*$_1$ condition may be attributed to this and to the effect of the response cost procedure upon those detected in violation of the time clock rule.

The termination of the formalized attendance procedure midway through the *Baseline*$_2$ appears to have been followed by a rise in violation rate. This suggests that the formalized attendance check procedure, in conjunction with the response cost procedure to which violators were subject, was sufficient to maintain the low violation rate produced by the correction procedure–i.e., the reinforcement of rule compliance. However, the termination of the formalized attendance check procedure most likely resulted in a deterioration of the staff's attendance-checking performance which, in turn, weakened the effect of the response cost procedures applied to detected violations and resulted in an increase in the commission of violations.

VARIATIONS IN TOKEN EXPENDITURE PROCEDURES AND THEIR PROBABLE EFFECT UPON EXPENDITURE PATTERNS

The emphasis of the experiments reported on to this point has been an examination of the manner in which various arrangements between selected activities and the awarding of EMLC points have influenced the probability of occurrence of those activities. Although the arrangement between the expenditure of tokens and access to backup reinforcers is as important as the arrangement between target behaviors and the awarding of tokens in influencing the performance of the to-be-reinforced activities, time limitations prohibited an experimental analysis of alternatives to the arrangements employed throughout the course of the present project. Two changes in the point expenditure procedures were instituted, however, and these, as well as the patterns of point expenditure throughout the course of the token economy, are reported upon here.

Response Definitions

As has been described previously, during the period the token economy was in operation, inmates expended EMLC points in three ways: (1) to gain access to the reinforcing event areas of the cellblock (the television room, poolroom, and the lounge); (2) to leave the cellblock, thereby gaining access to the remainder of the institution and the many individuals and activities available there; and (3) to purchase commodities, such as cigarettes, soft drinks, and snacks, from the token economy canteen. At the end of each day, the total number of points expended by each inmate was computed from the checks they had written to gain access to the reinforcing event areas and to obtain commodities from the token economy canteen. In addition, the time cards were collected at the end of each day, the total amount of time spent by each inmate in the institution during the hours of the token economy was determined, and these times were charged to their accounts at the rate of one point per minute.

Changes in Expenditure Procedures

Canteen opens. Because of difficulties in acquiring commodities, the token economy canteen was not open during the first two weeks the token economy was in operation. On the day preceding the introduction of the token economy, all inmates were informed that the canteen was not yet stocked with the commodities it would routinely offer but

that it would open in two weeks. A memorandum to this effect was also posted on the token economy cellblock bulletin board. The canteen opened on day 15 of the token economy.

Limited carry-over begins. No limits were placed on either the number of points that inmates could expend or the backup reinforcers which could be purchased. However, the average point balance quickly rose to an amount approximating a week's basic earning, with a quarter of the inmates maintaining balances in excess of a month's basic earnings. Although the performance of those with the amassed points was routinely at a high level, the limited carry-over procedure was introduced to circumvent the possibility that inmates would accumulate a sufficiently large number of points to reduce the conditioned reinforcing properties of each day's potential earnings and, thereby, precipitate a deterioration in performance.

On Monday, day 87 of the project, all inmates were informed that on the following Sunday, the number of points that each could carry forward from each Sunday to Monday would be limited to 600. Any unexpended points in excess of 600 would be dropped from the point record and the posted balance appearing on the Monday morning record would be 600. The special savings accounts in which inmates could accumulate points for the purchase of items from Sears' and Penney's catalogs were excepted from the limited carry-over procedure. Inmates could continue to transfer points from their checking to savings accounts, and these points would not be included in the 600 point limited carry-over. The opportunity to deposit points in the savings accounts continued to be restricted to Sunday evenings, and withdrawals from the special checking accounts continued to be prohibited. A memo detailing these procedures was posted on the token economy cellblock bulletin board. All inmates had the following week to prepare for the limited carry-over, and the new procedure was first practiced the following Sunday, day 93 of the token economy.

Results

The mean number of points brought forward (the point balance) in the inmates' checking accounts each Monday and the mean number of points deposited in the special savings accounts each Sunday that the token economy was in operation were determined by averaging all inmates' recorded savings deposits and account balances on those days. These mean values are presented in Figures 21 and 22, respectively. As can be seen in

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Figure 21, the mean point balance of the inmates' checking accounts, rose during the two weeks preceding the opening of the token economy canteen, and was highest the Monday morning the canteen opened. (As will be recalled, each day's posted point balance summarized the earnings and expenditures of the *preceding* day.)

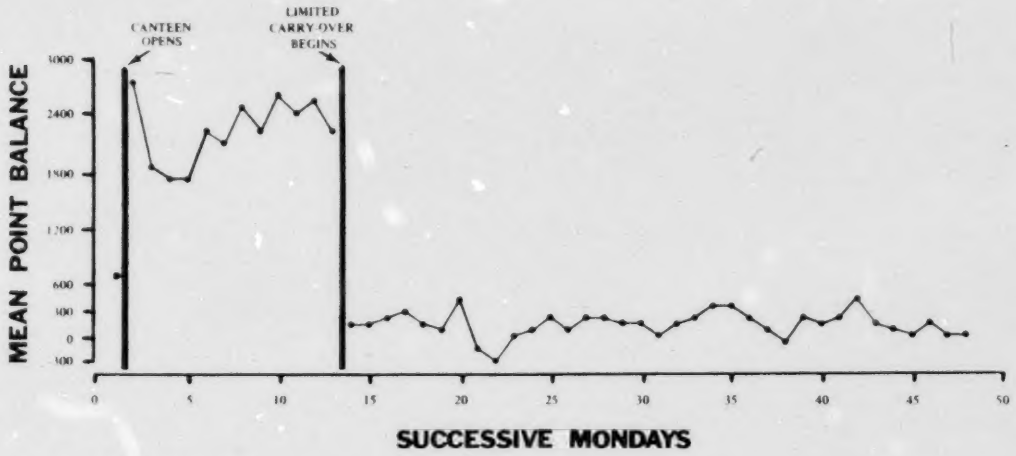

Fig. 21. Mean token economy point balances on all Mondays during the token economy.

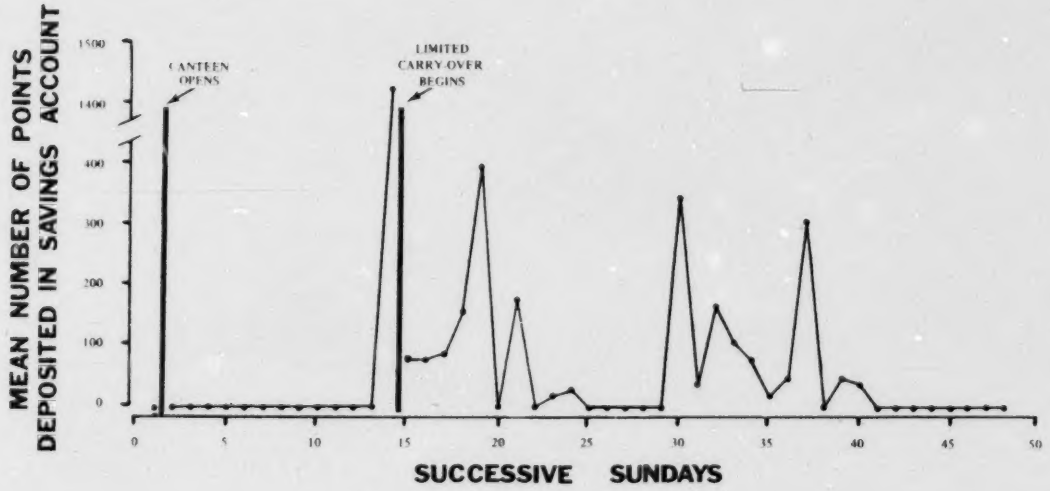

Fig. 22. Mean number of points deposited in special savings accounts on all Sundays during the token economy.

The mean point balance decreased approximately 30% the Monday following the opening of the canteen, but this was followed by a gradual increase until the mean balance carried forward from Sundays to the following Mondays stabilized at approximately 2,400 points. Following the introduction of the limited carry-over procedure, the balance brought forward each Monday fell to approximately 300 points, or one-half the maximum permitted. As Figure 22 indicates, no points were transferred from the inmates' checking accounts to the special savings accounts prior to the introduction of the limited carry-over procedure. An average of slightly more than 1,400 points were deposited in special savings accounts the Sunday preceding the implementation of the procedure, and this was followed by a rather irregular pattern of deposits for most of the remainder of the period the token economy was in effect.

In addition to the data discussed above, the mean number of points expended by each inmate each day the token economy was in operation as well as the mean number of points expended to gain access to the various reinforcing event areas, to leave the token economy cellblock and enter the remainder of the institution, and to purchase commodities from the token economy canteen were computed by combining and averaging the expenditures as reported on the daily Point Record. These mean values are presented in Figures 23, 24, 25, and 26, respectively, for the 338 days the token economy was in effect. As Figure 23 indicates, the inmates limited their expenditures during the 14 days preceding the opening of the token economy canteen and then expended the bulk of their accumulated points on the 15th day, the first day the canteen was open.

Figures 24 and 25, depicting expenditures to gain access to the reinforcing event areas and to the remainder of the institution, respectively, indicate that the number of points spent in these areas was unaffected by the opening of the token economy canteen. As would be expected, however, the shorter periods of operation of the token economy during weekdays in comparison to weekends and holidays are reflected in the inmates' point expenditures, with the mean number of points spent in these areas on weekdays approximately half that spent on weekends and holidays.

Figure 26, which represents expenditures to purchase commodities from the token economy canteen (excluding items purchased from the Sears' and Penney's catalogs through the special checking accounts), reveals a large expenditure the first day the canteen was open, followed by consistently high average expenditures throughout the remainder of the token economy. Expenditures in the canteen were markedly higher than expenditures to gain access to the reinforcing event areas or to the remainder of the institution.

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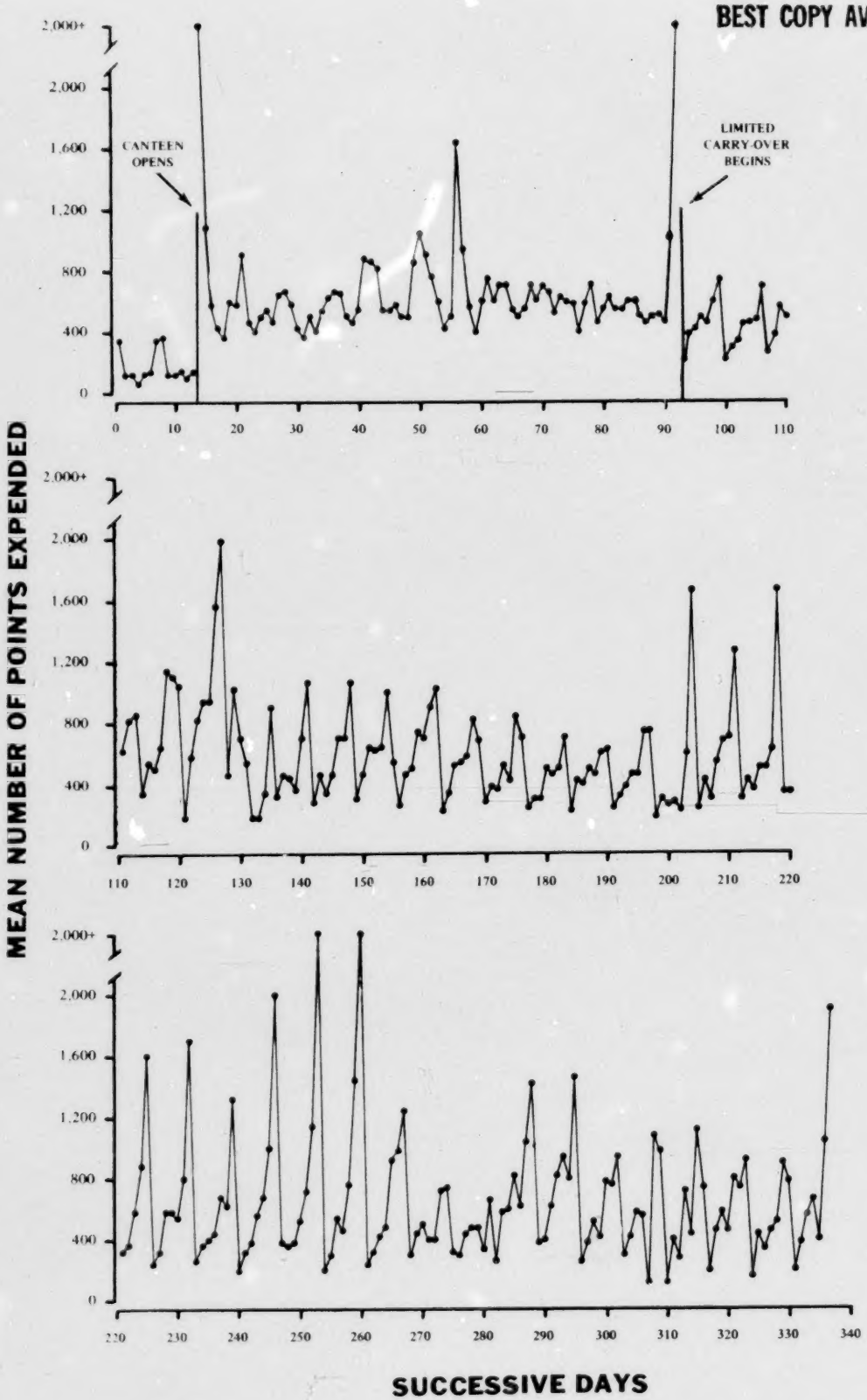

Fig. 23. Daily mean number of points expended by all inmates during the token economy.

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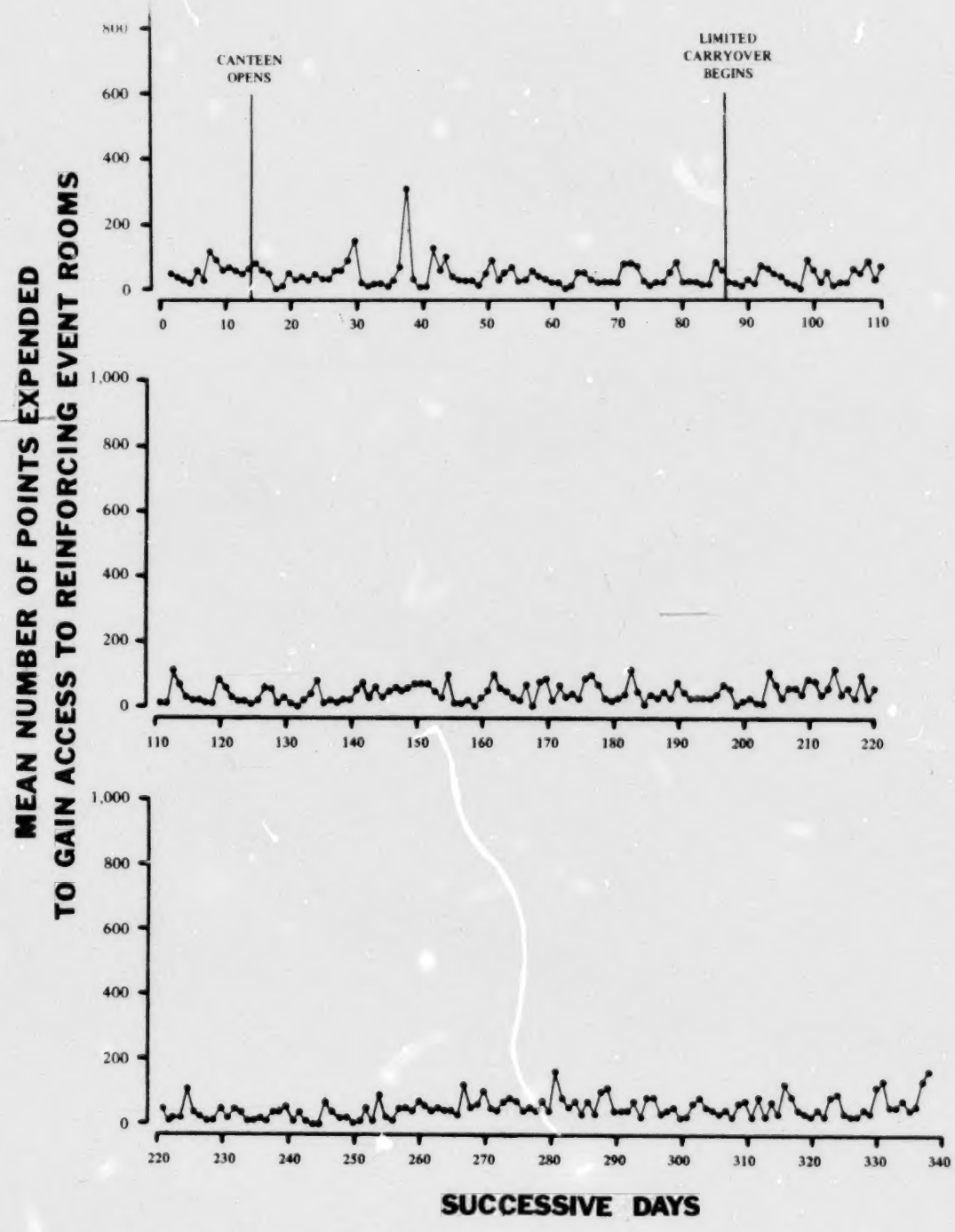
CANTEEN OPENS
LIMITED CARRYOVER BEGINS
MEAN NUMBER OF POINTS EXPENDED TO GAIN ACCESS TO REINFORCING EVENT ROOMS
SUCCESSIVE DAYS

Fig. 24. Daily mean number of points expended by all inmates to gain access to the reinforcing event rooms during the token economy.

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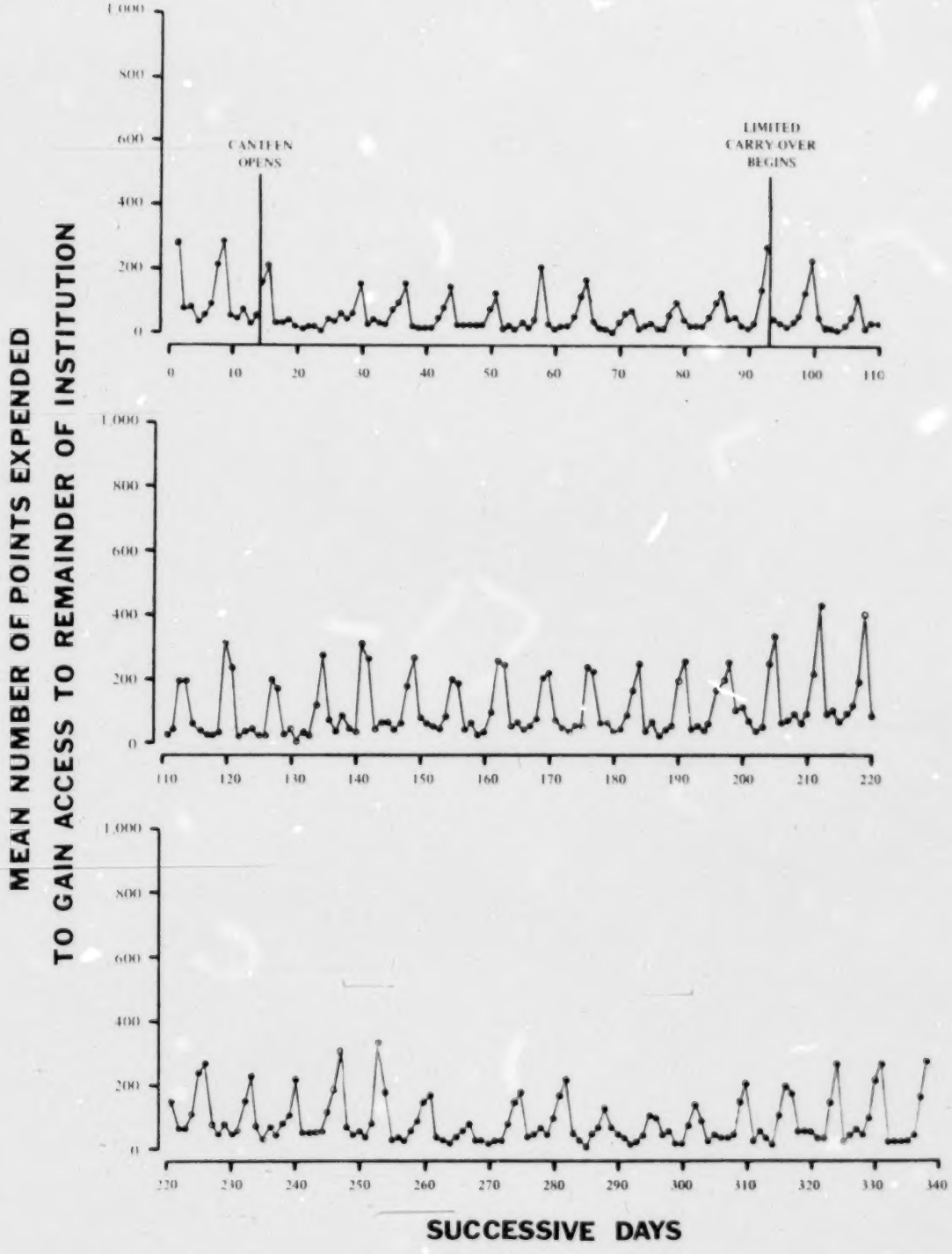

Fig. 25. Daily mean number of points expended by all inmates to gain access to parts of the institution outside of the token economy cellblock.

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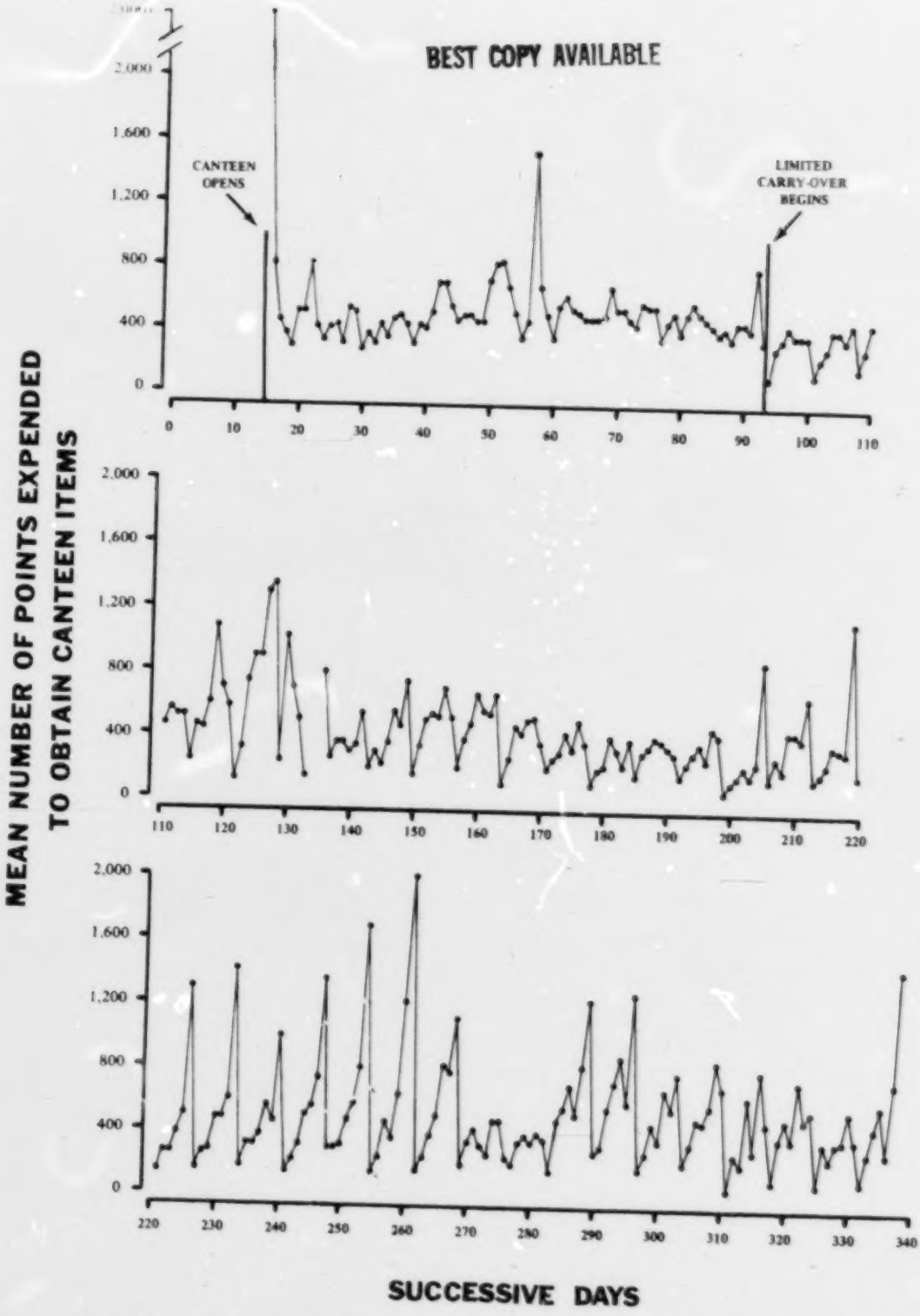

Fig. 26. Daily mean number of points expended by all inmates to obtain items from the token economy canteen.

There was virtually no difference in the number of points expended to gain access to either the reinforcing event areas or the remainder of the institution on weekdays, prior to the introduction of the limited carry-over procedure, with slightly more points spent to gain access to the remainder of the institution on weekends and holidays than to gain access to the reinforcing event areas. The introduction of the limited carry-over procedure had no effect upon either the number of points expended or the pattern of point expenditures to gain access to the reinforcing event areas of the token economy cellblock.

The introduction of the procedure did, however, appear to influence expenditures to gain access to the remainder of the institution and to obtain commodities from the token economy canteen. For the former, the introduction of the limited carry-over was followed by an exaggeration of the pattern of expenditures that had emerged during the first quarter of the token economy. Relatively few points were spent to gain access to the remainder of the institution on weekdays, but the number expended on weekends (the two days immediately preceding the dropping of the excess points) did increase somewhat. For the latter, the limited carry-over procedure resulted in an initial reduction in the number of points expended in the canteen on Mondays (the day following the dropping of the excess points), but the number of points spent there during the remainder of the week was relatively unchanged. Later, however, the number of points expended in the token economy canteen began to fluctuate, increasing for a period of time and then returning to the level seen just after the introduction of the limited carry-over procedure.

The average cost of operating the canteen was 61 cents per inmate per day. This value was computed by totaling the census of the token economy cellblock for all days the canteen was in operation and dividing the resultant number into the total cost to purchase both the commodities stocked in the canteen and the items purchased through the special savings accounts.

Discussion

The patterns of expenditures seen prior to and following the opening of the token economy canteen index the reinforcing properties of the commodities offered inmates through it. Not only did the inmates of the token economy cellblock restrict their expenditures in other areas of the token economy for the two weeks preceding the canteen

opening, they continued to do so throughout the period the token economy was in operation. Moreover, the token economy canteen was in competition with the institution store, which was operated by the Board of Corrections and sold (for "real" currency) similar items.

Although the per man cost for operating the token economy canteen was relatively low, even this cost could be reduced if potential reinforcers in the institution were incorporated into the token economy. If such things as extra recreation and telephone and visiting privileges, for example, were added to the reinforcing event menu, it is quite probable that they could effectively compete with the offerings of the canteen. Not only would such extras drive down the canteen expenditures, they would also increase the reinforcing properties of the tokens and, thereby, the probability that to-be-reinforced activities would be completed.

Ideally, however, the institution would abolish the practice of selling goods for profit through its store and instead operate it in the same manner that the token economy canteen was operated. The store would then be viewed as an adjunct to the management and rehabilitative programs, with the cost of stocking it completely assumed by the Board of Corrections. Not only would such a procedure provide the administration with powerful incentives with which to motivate performance of institutional assignments and participation in rehabilitative programs, but it would also ensure that all inmates had the potential of equal access to the items offered in the store. By so doing, it would end the unequal distribution of wealth in the institution and the regressive effects of this upon a goodly portion of the inmate population. Some inmates receive an abundant supply of funds from the family and friends, while others receive only the small amount (fifty cents every two weeks) provided by the institution. Needless to say, those with extensive funds can purchase virtually anything they wish, while those with no funds must turn to prison rackets and homosexual prostitution to get whatever money they can.

A FURTHER ASSESSMENT OF THE EFFECTS OF THE TOKEN ECONOMY UPON THE DAY-TO-DAY ACTIVITIES OF PARTICIPANTS

A checklist composed of 58 behavior categories describing activities in which the residents of the token economy cellblock might engage was employed to further assess the impact of the token economy upon the day-to-day activities of the participants. Administration of the checklist consisted of a staff member coding the activity of each resident of the token economy cellblock at periodic intervals. There were three observation periods: prior to, during, and following termination of the token economy.

Response Definitions

The Behavior Observation Checklist shown in Figure 27 was developed in a series of planning sessions in which project staff members, prison administrators, and prison inmates listed behaviors that are emitted within the correctional institution. These lists were then refined. Repeated categories were deleted and unobservable activities (e.g., thinking, worrying) were redefined or eliminated. The list was further amended through tryouts prior to the collection of the data presented herein. The final list of fifty-eight categories was used during each of the observation conditions. All the original categories were operationally defined. Most of these are adequately defined by their titles; however, brief descriptions of representative, less clearly titled categories follow:

Not Present on Cellblock. The number of residents not present on the token economy cellblock was determined in each administration of the checklist by subtracting the number of residents observed from the census of the token economy cellblock.

Watching TV - Other. Residents who were present in the television room when programs other than news, documentaries, sports, or religious presentations were showing were coded in this category.

Talking with Others - Other. This is the only category of four codes indicating conversations in the token economy cellblock. "Talking with Others - Other" refers to inmates observed engaging in conversations whose content could not be discerned during the brief observation required in the administration of the checklist.

Grooming. This category was used to indicate residents who were shaving, showering, combing their hair, brushing their teeth, or otherwise maintaining their personal appearance.

Maintenance - House. A prison inmate's "house" is that area surrounding his bed. Residents of the token economy cellblock were coded in this category if they were making their beds, dusting their dressers,

sweeping the floor next to their beds, or otherwise maintaining their immediate living area. Another category, *Maintenance - Unit*, referred to inmates cleaning other areas of the token economy cellblock.

Recreation - Participating. This category referred specifically to residents present in either the poolroom or the lounge who were actively participating in a game. Another category, *Recreation - Watching*, was coded whenever residents were observing a game in one of those rooms.

Student. Residents who were observed actively participating in the organized basic education programs within the token economy cellblock were coded in this category.

Reliability of Observations

Sixty-nine interrater reliability checks using the Behavior Observation Checklist were conducted throughout this analysis. In these, two researchers coded each resident's activity simultaneously and independently. The percentage of agreement was determined by dividing the number of agreements by the number of agreements plus the number of disagreements. The mean percentage of rater-rater agreements was 90.5%.

Conditions of Observation

The checklist was administered every 45 minutes between 4:30 P.M. and 9:45 P.M. weekdays, and between 6 A.M. and 9:45 P.M. Saturdays, Sundays, and holidays. Observations which are reported upon here were conducted each Thursday and Saturday for five consecutive weeks prior to, during, and following the termination of the token economy. Thus, there were 7 administrations of the checklist each Thursday and 21 administrations each Saturday for a total of 140 administrations during each of the three conditions.

An administration of the checklist consisted of a research staff member walking through all rooms in the token economy cellblock and coding each resident's activity. This procedure required about five minutes for each administration of the checklist. The data collected during each phase were accumulated, and overall percentages for each activity were computed by the total number of residents observed.

Results

For purposes of data summary, certain categories have been combined. Since a number of categories occurred so infrequently (not more than once for every one hundred observations in any observation period) that analysis would be unproductive, they were

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BEHAVIOR OBSERVATION CHECKLIST

Observer: _____ Date: _____ Time: _____

	Behavior	Count	Total
1.	Angry or rageful		
2.	Asleep - lying down		
3.	Asleep - sitting		
4.	Browsing in library		
5.	Dressing or undressing		
6.	Defacing or destroying property		
7.	Drinking		
8.	Eating		
9.	Exercising		
10.	Games and puzzles: group		
11.	Games and puzzles: individual		
12.	Games and puzzles: watching		
13.	Fighting		
14.	Grooming		
15.	Horseplay		
16.	"Hot railing"		
17.	Ill		
18.	Injured		
19.	Listening to music		
20.	Listening to radio - educational; news		
21.	Listening to radio - religious		
22.	Listening to radio - sports		
23.	Listening to radio - other		
24.	Listening to others - educational		
25.	Listening to others - religious		
26.	Listening to others - sex		
27.	Listening to others - other		
28.	Lying down - awake		
29.	Maintenance - house		
30.	Maintenance - unit		
31.	Participating in hobby		
32.	Reading - book		
33.	Reading - letter		
34.	Reading - papers or magazines		
35.	Reading - MDT related		
36.	Recreation - participating		
37.	Recreation - watching		
38.	Running		
39.	Sitting		
40.	Standing		
41.	Swearing or cursing		
42.	Talking with others - educational		
43.	Talking with others - religious		
44.	Talking with others - sex		
45.	Talking with others - other		
46.	Threatening someone		
47.	Urinating or defecating		
48.	Walking		
49.	Watching TV - educational; news		
50.	Watching TV - religious		
51.	Watching TV - sports		
52.	Watching TV - other		
53.	Writing - letter		
54.	Writing - other		
55.	Yelling, screaming, making noise		
56.	Student		
57.	Teaching assistant		
58.	Not present on cellblock		
59.			
60.			

Fig. 27. Behavior Observation Checklist employed to identify inmate activities at selected times prior to, during, and following termination of the cellblock token economy.

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combined into a category of "other" behaviors. Thus, the category titled "other" best refers to an inmate's being in the token economy cellblock and engaging in some activity other than those listed. Table 11 presents the percentage of occurrence of behavior in each of the remaining 18 behavior categories and the *Other* category for each of the three observation periods. They are listed in order of the magnitude of their percentage of occurrence during the pre-token economy phase. These data represent objective demographic observations for further evaluation of the token reinforcement procedures. Moreover, much of the information gathered during the pre-token economy phase of observations was used in the design of the structure of token system.

The category most often recorded was *Not Present on Cellblock*. More than 30% of the residents were away from the token economy cellblock during each of the three observation phases. There were many reasons for residents leaving their living area, e.g., movies, sports events, club meetings, and music shows that were not available in the token economy cellblock. In addition, many of the residents had friends or relatives in the prison population with whom they wished to visit.

TABLE 11

Activities of Residents of the Token Economy Cellblock Prior to, During, and Following Termination of the Token Economy

Behavior Category	Percent Baseline$_1$	Percent Token Economy	Percent Baseline$_2$
Not present on cellblock	33.3	32.7	33.9
Inactive	24.8	31.5	20.0
Watching television–other	9.2	1.9	11.9
Watching television–sports	4.9	.7	6.6
Talking with others	4.5	6.0	4.6
Grooming	2.6	1.8	1.7
Maintenance–house	2.4	2.0	1.9
Reading–papers or magazines	2.3	1.3	1.2
Reading–books	1.9	2.0	1.0
Recreation–participating	1.5	4.4	6.2
Maintenance–unit	1.2	1.0	.4
Urinating or defecating	1.0	1.2	.5
Watching television–news	.8	3.6	.3
Recreation–watching	.7	1.7	.9
Listening to music	.4	.9	1.5
Games and puzzles–group	.3	.3	3.2
Eating	.2	1.0	.3
Student	.0	2.7	.0
Other	6.0	3.1	3.6

Because the potential value of access to the main population of the prison as a backup reinforcer in the token reinforcement system was recognized, the token economy was structured so that residents spent points earned in the token system to purchase time away from the token economy cellblock. Since there was no apparent decrease in the frequency in which residents left the living area, it may be concluded that they retained full access to this activity and that the point cost assessed for this privilege was not excessively high.

Of the residents remaining in the token economy cellblock, a sizable proportion were coded in the *Inactive* category, indicating that they were not engaging in any clearly definable or significant overt behavior. In the pre-token economy observations, 24.6% of the residents were observed to be sleeping, lying in bed, walking from one room to another, etc. This proportion increased to 31.5% during the token economy, and it declined to 20% after the termination of the token economy. Another category, *Talking with Others - Other*, demonstrated a similar pattern, increasing from 4.5% during the pre-token economy phase to 6% during the token economy and decreasing to 4.6% after the termination of the token economy. Since the proportion of residents leaving the cellblock was essentially unchanged during the token economy, this indicates that some other activity in the token economy cellblock, itself, decreased in frequency.

The categories that most likely explain this pattern are *Watching TV - Other* and *Watching TV - Sports*. Each of these was recorded relatively frequently during the pre-token economy observations (9.2% and 4.9%, respectively) and each increased sharply during the post-token economy observations (to 11.9% and 6.6%, respectively). Just as access to the remainder of the institution was built into the token economy as a backup reinforcer, residents also expended points to watch entertainment or sports programs on television. This striking change in the pattern of activity of the residents was most likely the result of the charge for the privilege of watching television.

The third television watching category, *Watching TV - News*, exhibited a trend opposite to the entertainment and sports categories, increasing from 0.8% in pre-token economy observations to 3.6% during the token economy and decreasing to 0.3% after the termination of the token economy. The most likely explanation for this difference is that, at the time of the observations made during the token economy, residents were not expending points to watch news programs but, instead, were being *awarded* points for watching the evening news. Therefore, this finding may be considered a direct result of the procedures that were simultaneously being explored in Experiment 2.

A seemingly problematical result is the observation that the frequency of *Recreation - Participating* increased from 1.5% during the pre-token economy observations to 4.4% during the token economy (when residents were required to spend points to gain access to the poolroom and lounge) and again increased to 6.2% after the termination of the token economy. There is, however, an uncontrolled variable that affects this finding. During the pre-token economy observations, the only recreation equipment available was a Ping-Pong table and some table games. The pool table, which proved to be far more popular, was acquired immediately prior to the start of the token economy.

The changes in the *Student* category are also likely the result of the token reinforcement procedures. Even though all educational materials were available during each of the observation phases, residents were only observed using them during the token economy (2.7% of the observations), when points were awarded for participation in the organized education programs. Although higher than during the $Baseline_1$ condition, the relatively low level of participation seen here during the token economy further justified the procedures explored in Experiment 3.

Discussion

The administration of the Behavior Observation Checklist prior to, during, and after the token reinforcement procedures produced a description of the activity of the participants in the token economy under those three conditions. The observations made prior to the implementation of the token system indicated certain high probability behaviors that were used as backup reinforcers in the token economy. These included access to the general institution population and access to the television and recreation rooms. An analysis of the probability of the occurrence of these behaviors before, during, and after the token economy indicated areas in which the system may have resulted in a change in the pattern of behavior of the inmates.

It appears that the charge for access to the remainder of the institution did not substantially restrict the movements of the residents to and from the token economy cellblock. At the same time, the charge for television watching appears to have suppressed somewhat the watching of entertainment or sports programs. Although the effect of charging for admission to recreation rooms was confounded by the addition of new recreation equipment, the inmates did spend more time in recreational activities during the token economy than before it. The token system also seemed to increase the likelihood

of certain behaviors. Watching television news and participating in the education program, both of which were rewarded with points during the token economy phase of observations, were observed more often during than either before or after the token economy. These data indicate that the token economy did not deprive the participants of anything to which they routinely had prior access. Instead it offered them additional incentives for sustaining high levels of performance.

GENERAL DISCUSSION

The objective of this project was to examine the feasibility of systematically deploying the technology of applied behavior analysis to aid in the understanding and solution of the problems confronting those charged with the care and rehabilitation of the institutionalized male felon. This objective grew from an analysis of various aspects of the correctional process and the inescapable conclusions to which it gave rise, namely: (1) that correctional institutions will continue to exist and continue to confine men and women offenders; (2) that the minimum necessary objective for all correctional institutions is to assure that offenders return to society at least no worse for their prison experience; (3) that those concerned with corrections have a responsibility to make available to incarcerated offenders programs that at least have the potential of increasing their chances of success upon release; (4) that, in addition to simply making rehabilitative programs available, correctional workers must also encourage offenders to participate in these programs; and (5) that such efforts will not retard but instead hasten the reforms in correctional practice which are so urgently needed.

Additionally, this project's objective was also generated from an examination of the policies and procedures practiced by correctional centers vis-a-vis the care and rehabilitative services provided to the institutionalized offender. These policies and procedures often stress the use of punitively oriented practices to suppress unwanted actions and the use of aversive control procedures to motivate the performance of required activities. In addition, the bulk of both the undesired and desired activities are, at best, only vaguely defined, creating a situation that cannot help but foster inconsistency and arbitrariness on the part of both line and supervisory correctional staff. All too often the inmate, who is never able to predict with complete certainty what is expected of him or how the administration will react to what he does, concludes that the staff is, at best, whimsical or, at worst, discriminatory and vindictive in their dealings with him and his fellow inmates. Not only do such conditions negate effective rehabilitation programs, they undoubtedly contribute in large measure to the unrest festering in today's correctional institutions and to the generally regressive effects of imprisonment upon the released offender's ability to adjust to community life.

It is apparent that the conditions that have evolved in the correctional institution encourage the inmate, albeit unintentionally, to isolate himself from the institution staff

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and the bulk of the inmate population. He does only those things which are required of him and rarely volunteers for additional work. He establishes a small circle of confidants and spends his leisure time with them or by himself. He attempts to maintain a clean record, make no enemies among either the institution staff or the inmate population, and counts off the days remaining until he is to appear before the parole board or he is to be released, either the short way (with "good time") or the long way (without "good time"). Unfortunately, such a course of action leaves the inmate no better prepared for life in the community than he was prior to his apprehension, conviction, and imprisonment.

Finally, an essential consideration in formulating this project's objective was the evaluative research assessing the effectiveness of a variety of approaches for solving problems in corrections and closely allied fields. An examination of the evaluative research data indicated that the techniques of applied behavioral analysis have enjoyed considerable success in the health-related fields and also with predelinquent youths and juvenile offenders in the criminal justice system. Although this research appears to indicate that applied behavior analysis holds significant potential for better understanding and remediating the behavior of the adult offender, it was concluded that a clear demonstration of its applicability to the adult offender population is seriously lacking. Indeed, the principles of behavior have been developed, validated, and refined with populations, such as school children and mental patients, that bear little similarity to the adult male felon.

Satisfying Institution Management Requirements

In this exploration of the utility of applied behavior analysis in an institution for adult male felons, those inmate activities of continuing concern to the administrators of correctional institutions were examined first. It is both unfortunate and understandable that the typical line administrator is forced to rank inmate management higher in priority than inmate rehabilitation. When challenged about these rankings, most administrators will acknowledge the reversal of priorities and counter that effective rehabilitation programs cannot be operated in an inefficient and mismanaged institution. It appears, then, that administrative and supervisory personnel would welcome the opportunity to free themselves of this burden, and that procedures which proved to be effective motivators of inmate performance in these areas would be carried forward as they moved to meet their additional priorities.

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More importantly, this strategy provided the opportunity to demonstrate that procedures that stress incentives and positive reinforcement for performance and accomplishment are as or more effective in achieving institutional objectives than those that stress punishment and aversive control for infractions and nonperformance. It appears that the policies and procedures that the correctional institutions now employ to govern inmate life undoubtedly contribute in large measure to both the unrest in correctional institutions and the regressive effect a period of imprisonment appears to exert upon a released offender's ability to function well in the community. It is as if the correctional institution, with its emphasis upon obedience, passivity, and punishment and aversive control procedures, is "well designed," albeit unintentionally, to instill dependence, lack of initiative, resentment, and aggression–traits that most would agree are maladaptive both within the correctional setting and within the broader context of society. Indeed, it is difficult to conceive of how any environment could be better designed to achieve these ends.

Obviously, then, the objective of this project was not to engineer the institutional environment and introduce contingencies between behavior and potential consequences where none had existed before. Instead, the goal of the project staff was to re-engineer the environment, substituting contingencies of positive reinforcement for the already-existing contingencies of punishment and aversive control. By so doing, the project moved toward the development of a management system capable both of insuring order and discipline, while placing only minimal reliance upon the threat of punishment as a control procedure, and of providing for the performance of necessary maintenance tasks and work assignments without primary recourse to the use of aversive control procedures. In this, the project sought to attack what may be the two most significant conditions underlying the regressive effects of imprisonment upon the released offender's readjustment in the community.

Each of the experiments conducted during this project sought to assess the manner in which selected target behaviors were affected by rearranging, in one manner or another, conditions existent in either the correctional institution at large or the token economy cellblock itself. These experiments clearly demonstrated that the same principles of behavior that have been validated and refined in a variety of different areas are no less applicable to the adult offender than they are to other nosological groupings. Perhaps even more importantly, this project demonstrated that it is feasible to deemphasize punishment and

aversive control procedures in correctional institutions if care is taken to replace them with appropriately designed and monitored contingencies of positive reinforcement. Within this context, this project also demonstrated that these new procedures may be effectively employed by the line correctional officer, if he is provided the necessary training and made part of an accountability system such as that which is an integral part of any well-designed token economy or other endeavor involving applied behavior analysis. Here, a correctional officer, trained in the principles of applied behavior analysis and the specifics of the tasks he was expected to perform, operated the token economy cellblock during most weekday mornings. An accountability system, consisting in this instance of two forms of reliability measures, which operated as part of the token economy, both revealed and insured that the officer did not either accidentally or intentionally deviate from the established procedures of the token economy.

A correlative project of the Experimental Manpower Laboratory for Corrections (Smith, Hart, & Jenkins, 1973) supports this demonstration. In that study, correctional officers received intensive training in the principles of behavior modification and on-the-job practicum experience in the application of those principles. Although a small number of officers failed to achieve proficiency in the rudimentary skills required of a behavioral technician (e.g., objectivity and reliability in the counting, recording, and consequating of behavior), most officers quickly mastered these skills and demonstrated their ability to conduct programs designed by them in conjunction with the training staff. In addition, some officers demonstrated the ability to go beyond the technician level by independently designing and carrying out a behavior change program.

Equally important were the results of an assessment of the inmates' perceptions of the officers. The inmates reported that the correctional officers receiving training and practice in behavior modification appeared to become more friendly, more interested in the inmates as individuals, and less punitive over the course of training when compared to their untrained counterparts. It appears, then, that the principles of behavior employed in the operation of the cellblock token economy are not only a viable alternative to the punitively oriented and aversive control procedures now most prevalent in corrections, but they have the potential of enabling corrections to change the image of the line correctional officer, thereby allowing the officer–the man who has daily contact with the inmate–to participate in the rehabilitative effort.

Although Experiments 1 and 2 explored the effectiveness of token reinforcement procedures as alternative motivators of routine activities necessary for the day-to-day

operation of correctional institutions, these investigations were not considered as ends in and of themselves. Instead, Experiments 1 and 2 were demonstrations that the techniques of applied behavior analysis can be of potential utility in advancing a wide variety of endeavors with adult felons. Consequently, they were a step toward the EMLC's longer-term objective–that of bringing applied behavior analysis to bear upon problems more closely related to the particular rehabilitative needs of the adult felon population. That longer-term objective was more fully realized in the leisure-time remedial education program that was examined in Experiments 3 and 4.

Implem ating Effective Rehabilitation Programs

A large majority of the offenders incarcerated in America's correctional institutions are undereducated. Nearly all lack high school diplomas or their equivalent; most have not progressed further than the junior high school level; and a sizable proportion have not even mastered the basic reading and arithmetic skills taught in the elementary grades. It follows, therefore, that a prime objective of the expanded utilization of applied behavior analysis in corrections and the criminal justice system will be to encourage the inmate to remedy the long-standing educational, interpersonal, and vocational deficiencies that bar the typical offender from all but the most menial, degrading, and lowest paid positions of our society and, consequently, from access to the enriched life all Americans have come to anticipate. Until the bulk of the inmates leaving the correctional institution for the community have acquired the skills necessary to become economically productive, it is unlikely that the criminal justice system will have any real impact upon recidivism, for it has not, in fact, provided the typical offender with a competitive alternative to crime as a means of securing the goods and services from the American society.

To date, however, the remedial education programs in correctional institutions have been notoriously unsuccessful in remediating deficiencies. All too often, the opportunity to participate in an education program is viewed as an "easy lick" and made available to only the "better" inmates–usually those who have already mastered the basic skills necessary for participation in society–and the "sorry" inmates–usually those who, for one reason or another, have not acquired these basic skills in the public school system–are denied access to the educational programs. The possibility of participating in a remedial education program most likely is the last opportunity many inmates will have to master those reading and arithmetic skills that are generally necessary precursors to successful reintegration into society. However, those inmates most in need of basic educational skills

who are offered the opportunity and do enroll in a remedial education program typically do so more to avoid the menial work they would otherwise be required to perform than to overcome the educational deficiencies so in need of remediation. This indifference to the subject matter is typically indexed by the relatively low levels of academic performance and the slow progress towards remediation of deficiencies that characterize most institutional remedial education programs. Those inmates who are the most resistant to the educational system–again, typically those most in need of the offerings of the remedial education program–are quickly identified and disenrolled. In short, the majority of those most in need of the institution's remedial education program are denied access to it; and, of those who are enrolled, most fail to perform at the minimal levels required and are soon disenrolled.

For most, the routine of institution life and "make-work" job assignments is no less appealing than the apparent regimentation of academic and vocational training, and this is particularly true for those who have experienced, for one reason or another, nothing but failure in similar situations in the public school system. Consequently, the threat of disenrollment is typically ineffective in motivating their active participation in the program. Moreover, there is no guarantee that active participation in any of the various programs offered by the institution will shorten the inmate's stay in the institution, for many who do not participate are released as or more quickly than many who do. Finally, those few who do commit themselves to a rehabilitative program must withstand the subtle and overt rebuffs and persecution of those in the inmate population who view such participation as a threat to the inmate subculture and the many benefits which they derive from it.

Again, it is apparent that these conditions can only exert a regressive influence upon any rehabilitative endeavor and that they require remediation. It is also again apparent that their remediation will not take the form of introducing contingencies where none existed before, but instead the remediation will involve supplanting contingencies that foster nonparticipation in rehabilitation programs with those that encourage the inmate to avail himself of the services offered in correctional institutions. One strategy that has gained considerable popularity is to make the offerings themselves more appealing: operate the program in an appealing environment, provide services that the inmate can readily identify as meaningful, employ training materials with which the inmate is comfortable, utilize staff members who have the potential of establishing rapport with the inmate, etc. The

leisure-time remedial education program that was operated throughout the course of this project was designed with these considerations in mind. The education area was well lighted, heated in the winter, and air-conditioned in the summer; the program itself was designed to remediate the inmates' obvious deficiencies in reading and basic mathematics; the educational materials employed were selected specifically for use by an adult urban population of which the inmates were typical; and the project staff were all free-world (noncorrectional staff) people in their twenties or early thirties, including ex-offenders and blacks as well as non-offenders and whites.

Unfortunately, making the remedial education program intrinsically appealing had little, if any, impact upon the inmates' participation or performance in it. As Experiment 3 revealed, virtually none of the inmates of the token economy cellblock took advantage of the program prior to the implementation of the token economy. However, participation in the remedial education rose under the initial token reinforcement condition and then increased again when the license procedure was introduced. At best, making the education program intrinsically appealing made the task of the motivation system less difficult. That is, if the program had not been made as appealing as it was, it would have been quite likely that a greater magnitude of reinforcement would have been required to reach the same performance level. What is most apparent in this experiment is that the engineering of contingencies–in this case in the form of a token economy–was clearly necessary to gain inmate participation in the educational program, and will probably prove to be equally important in other educational programs and in other institutions.

Operating Experimental Programs in the Correctional Setting

Every effort must be made to insure the physical safety and psychological well-being of the inmate as the criminal justice system researches alternative methods of offender rehabilitation. At the very least, the criminal justice system must establish minimum standards of inmate care regarding interpersonal contact, food and exercise, mail and visiting privileges, etc., and these must be inviolate. As the criminal justice system becomes more research-oriented, as indeed it must if it is to develop programs of benefit to the offender, it increases the possibility that it will sanction poorly conceived and poorly executed experimental projects that have the potential not only of doing harm to the offender but also of outraging the public to such a degree that subsequent research endeavors and the potential benefit they offer the offender are blocked. The criminal justice system must take decisive steps to guard against this possibility.

Undoubtedly, the most effective means the criminal justice system has of guarding against projects of potential harm to its charges is the careful selection of professional personnel. It is especially important that the professional staff responsible for the design and operation of experimental projects within the criminal justice system be of the highest caliber. Not only must they possess a high degree of technical competence, but also they must adhere to the most stringent of ethical principles and demonstrate the deepest of concerns for the rights and dignity of their fellow men as they move to carry out their responsibilities.

To further insure the protection of the offender, the criminal justice system must insist that its professional staff routinely submit their experimental projects to the review of their peers throughout the professional community. By so doing, the criminal justice system will further guarantee that these programs are of the highest quality and in the best interests of all concerned. A formal peer review policy not only insures that the professionals within the criminal justice system are abreast with the most advanced thinking in the field but also that their experimental endeavors receive the scrutiny and constructive criticism essential to program refinement and the safeguarding of participants.

Although a combination of a thoroughly qualified professional staff and a formal policy of peer review is an effective safeguard for the offender's safety and well-being. it is desirable that the criminal justice system also open its experimental programs to public view and inspection. Not only does the public, as the financial backer of these efforts, deserve to be kept fully informed of their nature and objectives, but an informed public is the most effective means available to the criminal justice system for protecting itself from the polemics, uninformed criticism, and emotional diatribes which, all too often, characterize discussions of its experimental endeavors. Equally important, however, an informed public contributes to the safeguarding of the offender, for it better insures the speedy elimination of those projects which either exert an undue hardship upon the offender while under the care of the criminal justice system or have a detrimental effect upon his adjustment once he returns to the community.

In addition, the potential contribution of the offender both to experimentation within the criminal justice system and to the safeguarding of himself and his fellow offenders should not be underestimated. The offender, by dint of his intimate knowledge of the interworkings of the criminal justice system and the inmate subculture, can provide the professional staff information through advice and counsel that it would otherwise take

the staff years to acquire if, indeed, they could, by the nature of their position in the system, acquire at all. The research staff that includes ex-offenders among its members will undoubtedly recognize and take into consideration a number of important variables that it otherwise would be slow to identify or would overlook altogether. Similarly, the research staff that makes provisions both to listen to the suggestions and complaints of its target population–the offenders–and then to give weight to these when questions concerning the operation of its project are debated will undoubtedly devise more efficient and effective procedures than it would otherwise be capable of developing.

Finally, the criminal justice system must avoid the coerced participation of offenders in experimental projects that seek to research as yet unexamined practices or unvalidated procedures. It is especially difficult, however, to specify the defining characteristics of "voluntary participation" within the context of the operational policies of a correctional institution, for it is quite likely that an inmate's participation in an experimental project–or, for that matter, any project–is easily influenced by the promise, be it explicit, implicit, or inferred, that his decision to participate will have a favorable influence upon the time of his release from the institution (e.g., positive decision by the parole board, the award of additional "good time," etc.). It appears, therefore, that the voluntary nature of an experimental program within a correctional institution is best guaranteed when it is made explicit that the refusal to participate, participation itself, and the decision to terminate participation in no way influence an inmate's date of release from the institution. Moreover, the generally impoverished living conditions of most correctional institutions further dictate that the magnitude of any potential improvements in the quality of life which might accrue to an inmate as a function of his participation in the program would not be reasonably expected to entice him to either enter or continue in a program causing him physical or psychological harm.

Distinguishing Between Experimental Programs and Analytical Procedures

A distinction must be made between *experimental* and *analytical* programs. As was indicated above, an experimental program was considered to be one which seeks to explore unexamined practices or unvalidated procedures. Such a program is, by its very nature, analytical, for its avowed purpose is to establish empirically the relationships between the policies and procedures under study and specified dependent variables and outcome measures. However, not all programs employing analytical procedures are experimental in the sense that they are researching unexamined practices or unvalidated procedures.

Programs based upon accepted practices and validated procedures should be no less analytical than experimental programs, for accountability, the refinement of accepted practices, and the extension of validated procedures are indispensible ingredients in both the day-to-day provision of effective services and the perfection of the technology of behavior change. To the degree that analytical programs deploy accepted practices and validated procedures, the applicability of the voluntary constraint safeguard of the experimental program is diminished.

The program reported upon here was in the above sense an analytical program, not an experimental one, for the general practices and procedures examined have been accepted and validated in other areas of endeavor, if not in corrections in particular. Nevertheless, the project did incorporate all the safeguards outlined above. As the report on the administration of the Behavior Observation Checklist indicated, the project did not deprive the residents of the token economy cellblock of anything to which the inmates in the remainder of the institution had easy access. Indeed, it improved the quality of the residents' lives, for it retained all those things and introduced added incentives. These added incentives were not, however, of such a magnitude that they would be expected to induce an inmate to volunteer for or continue his participation in the program if it were doing him physical or psychological harm.

Early in the operation of the cellblock token economy a five-member review panel composed of prominent psychologists and sociologists visited on-site at Draper Correctional Center and reported their findings to the project's funding agency. In addition, the project was reported upon and discussed at a number of professional meetings. Many of the suggestions made by the members of the review panel and by other peers at the professional meetings were incorporated in the operation of the project. The project itself was under constant public scrutiny. The Board of Directors of the Rehabilitation Research Foundation, which operates the Experimental Manpower Laboratory for Corrections under contract from the U. S. Department of Labor, consists of respected professionals and civic leaders. Moreover, throughout its duration, the project was visited by a steady stream of concerned citizens, civic groups, college and university classes, and representatives of the media.

The project staff included an ex-offender, and regular group meetings were scheduled with the residents of the token economy cellblock for the express purpose of airing their grievances and soliciting their opinions and suggestions, and these played an important

part in the staff decision-making process. Finally, participation in the project was voluntary as defined previously. Not only did participation in the project not influence an inmate's date of release from the institution, but an inmate could also eliminate himself from the project by following routine institutional procedures, and the decision to terminate participation, although not encouraged, did not influence either the inmate's status or quality of life within the institution or his date of release from the institution relative to his condition prior to his enrollment in the project.

As has been indicated previously, the target behaviors in Experiment 1 were general activities, such as the maintenance of one's living area and personal hygiene, that are expected of virtually all individuals living in group settings, be they mental hospitals, college dormitories, military barracks, or correctional institutions. In Experiment 2, the nature of the relationship between the magnitude of token reinforcement and the performance of target behaviors was further explored, and a tentative conclusion concerning the exact nature of that relationship was reached. The objective of Experiment 3 was to encourage the inmates of the token economy cellblock to participate in a leisure-time adult remedial education program from which, according to diagnostic testing, virtually all could profit. Experiment 4 also dealt with the leisure-time education program and explored the relative effectiveness of three formats for presenting programmed instructional material. Experiment 5, the last, explored a method by which participants in the token economy would be encouraged to follow more closely a basic rule governing the operation of the token economy itself.

From Experimental Investigation to System-Wide Utilization

The role of research in the evolution of correctional programming is an important one. The crimina! justice system is now in the position that the mental health field found itself a half-century ago: both professionals and the informed public alike recognize the inadequacies of current practices and urge the search for more effective alternatives. As the criminal justice system develops both a research orientation and a research capability, it will, as the mental health field has, begin the difficult task of identifying shortcomings and validating effective strategies. Only through experimental research will the criminal justice system come to determine with any certainty which of its established procedures are beneficial and are to be retained and which are harmful and are to be eliminated. Similarly, experimental research is the only method available to establish which of the

proposed strategies will advance the rehabilitative effort and are to be adopted and which would retard that effort and are to be rejected.

The ultimate goal of research within the criminal justice system should be to upgrade the quality of services offered the offender and to refine the strategies followed in working with him. Experimental projects are of little value unless the criminal justice system makes use of their findings in its dealings with the offender. Those shortcomings that experimental projects reveal should be eliminated from the system in general. Similarly, strategies and procedures that have been validated in experimental programs should be implemented throughout the system in general. Continued caution must be exercised, however, to insure that the offender is not abused as these strategies and procedures are deployed on an increasingly broader scale.

Clearly, the nature of some strategies will demand that they continue to be offered on a voluntary basis alone. For example, the effectiveness of aversion therapy in the treatment of alcoholism, drug addiction, and sexual deviancy has been repeatedly demonstrated in the medical and mental health fields (e.g., Rachman & Teasdale, 1969), and these findings would undoubtedly be replicated by careful experimental research in the criminal justice field. Such a demonstration would certainly justify a move upon the part of the criminal justice system to make aversion therapy available to those who requested it. Most would agree, however, that any form of coerced participation in such a program would be both unethical and unjust and must be expressly prohibited.

Conversely, the nature of some other strategies will demand that they be incorporated within the criminal justice system as standard operating procedures, and, as such, be applied equally to all those with whom the system has contact. As has been discussed previously, for example, the heavy reliance of corrections upon punishment and aversive control procedures in its dealings with the inmate population appears to contribute to both the unrest in correctional institutions and to the regressive effect a period of imprisonment appears to exert upon the offender. Moreover, the procedures that govern the award and withdrawal of "good time" reflect this reliance. Good time is typically computed and awarded when the inmate enters the correctional system and is then taken away unsystematically as he either violates one or more of the seemingly endless number of ill-defined prohibitions or, for whatever reason, incurs the wrath of one or more of the members of the correctional staff. The research reported upon herein suggests that good time might be better utilized to systematically encourage desirable behavior than to

unsystematically discourage undesirable behavior and, by so doing, might contribute to a reduction of both the unrest in our correctional centers and the regressive influence of the institution upon the inmate. If additional experimental research validated this hypothesis, it would certainly justify a move on the part of corrections to replace its old good-time policies, which stress punishment and aversive control, with alternatives that emphasize positive reinforcement. Indeed, most would agree that to do otherwise would be both unjust and unethical.

The introduction of applied behavior analysis in the correctional setting requires formalization of the practitioner-client relationship, in the sense that the practitioner must make explicit whom he considers his clients to be. It is an unfortunate oversimplification to identify the inmates alone as "the clients" of the professional psychologist, sociologist, social worker, or psychiatrist working in corrections, for not only does this reduce the likelihood that the professional will have any significant positive impact upon the inmate, either while in the institution or following his release, but it also ignores others whose physical and psychological well-being should be of concern to the practitioner. The professional in corrections must acknowledge that he has, in fact, three distinct groups of clients: the inmates, to be sure, but also the correctional staff and the public at large.

If the professional fails to acknowledge the priorities and prerogatives of the correctional staff and the representatives of the community–judges, legislators, members of the parole board–it is unlikely he will have any effect upon the practices of the criminal justice system or, by extension, the offenders who pass through the system. Of course, viewing the criminal justice system from the differing perspectives of these three client groups makes clear the necessity of compromise and, by so doing, increases rather than diminishes the potential contribution of the professional. In this, he must insure that the compromises to which he is a party in no way harm and in every way possible benefit the incarcerated offender, the person who continues to be at the mercy of and, typically, suffer from the whims and prejudices of the institution and the representatives of the public.

This is particularly true within the context of applied behavior analysis, for the professional who has mastered this technology and is in a position to supervise its proper application can contribute greatly to the success of correctional programs. For too long, however, correctional programs have been designed to serve the administrative ends of the criminal justice system with little, if any, real concern about the programs' impact

upon the quality of the offender's life in the institution and his eventual readjustment in the community. It is therefore especially important that both the practitioner within the criminal justice system and his professional peers in other areas of endeavor be sensitive to these ethical constraints. The practice of applied behavior analysis by ill-prepared individuals or its direction towards the attainment of less-than-ideal goals could compound rather than remediate this disservice to the institutionalized offender and to society.

Successful Transition from Institution to Community

An enduring concern of the applied behavior analyst centers upon the degree to which changes in behavior achieved in one setting or under one set of conditions will be continued in other settings or under other sets of conditions. A common criticism of this particular approach to the understanding and remediation of human problems is that behavior change induced by artificial means in the remedial education classroom, mental hospital, or correctional institution is of little utility, for it is unlikely that the behavior change will be maintained once the individual leaves the controlled setting and returns to the natural environment. Moreover, many of the findings reported herein, which indicate that changes in behavior correlated with changes in environmental contingencies are short-lived once changes in environmental contingencies are reversed, are often interpreted as supporting this argument. Critics who construct such an argument, however, have not yet grasped either the complexities of this approach to the understanding of human behavior or the subtleties involved in its application to the solution of human problems. Indeed, such critics might be genuinely surprised by the degree to which applied behavior analysts would support them in this argument, insofar as it goes.

Most applied behavior analysts operate under the assumption that modified behavior will *not* generalize from one situation to another if the transition is rapid or the two situations are markedly different. Similarly, they also assume that behavior maintained by certain contingencies will not be maintained by others if the change is sudden or the contingencies are greatly dissimilar. These assumptions do not, however, represent critical weaknesses within this approach to human behavior. Such assumptions, instead, are among its more important strengths, for they formalize the now generally accepted premise that all intervention programs–no matter what their theoretical basis–must provide continuity of care and treatment if they are to maximize the likelihood that they will yield enduring effects. An important advantage of applied behavior analysis is that it offers the practitioner

detailed information and specific technical procedures to more effectively provide this continuity.

Two general procedures are employed to help insure that behavior changes produced in a particular setting or under a particular set of contingencies will generalize to another setting or be maintained under another set of contingencies. One is *fading*, in which distinguishing characteristics of the training environment are changed in a gradual and progressive fashion until they approximate or are indistinguishable from those of the setting in which the behavior is to be continued. The second procedure entails the *attenuation of reinforcing consequences*. Here, the focus of attention is upon differences between the contingencies of reinforcement programmed in the training situation and those occurring naturally in the environment in which the behavior is to be maintained. Typically, the contingencies programmed in training situations employ different types of consequences, greater quantities of reinforcers, and richer schedules of reinforcement than those of the natural environment. In the attenuation of reinforcing consequences, these differences are also eliminated in a gradual and progressive fashion until the contingencies of reinforcement operative in the training situation come to approximate or are indistinguishable from those of the natural environment in which the newly acquired behavior is to be continued.

Although fading and the attenuation of reinforcing consequences contribute greatly to the generalization and continuance of intervention effects, they succeed only when the conditions of the natural environment are such that they do, in fact, maintain the behavior change once the artificial support of the training setting is fully withdrawn. All treatment endeavors, regardless of their theoretical orientation, acknowledge this obstacle to effective intervention. Accordingly, the practitioner must be prepared to deal with two general possibilities: an analysis of the environment might reveal that there are no naturally occurring contingencies to support the behavior change or that the naturally occurring contingencies are such that they will foster older, inappropriate forms of behavior at the expense of the newly established alternatives.

To overcome these difficulties, more and more applied behavior analysts either precede or accompany individuals as they return to the environment in which new behavior is to be maintained. The emphasis of their endeavors has been upon rearranging naturally occurring contingencies and reeducating significant others in the lives of these individuals so that the natural environment can support changed behavior. Indeed, most applied behavior analysts working in the natural environment have redefined the practitioner-client

relationship. No longer is the individual who is the focus of the therapeutic process looked upon as the sole or primary client. Instead, clients are defined as those people who, for one reason or another, are the significant others in the lives of these individuals, those who can support changed behavior once the individual does return from the training setting. Clearly, then, applied behavior analysis dictates that it not be assumed that behavior change accomplished under one set of contingencies in the training environment will transfer to and continue under other sets of contingencies in the natural environment. It is equally clear, however, that the careful utilization of appropriate procedures of applied behavior analysis can maximize the likelihood the services provided in the training environment will be effective, and that desired behavior change will generalize to and be maintained in the natural environment.

The token economy cellblock reported upon herein was typical of most "prosthetic environments." In this, it employed artificial contingencies to encourage inmates to remediate deficiencies they would not otherwise seek to overcome and to acquire skills they would otherwise be incapable of mastering. Although some skills, such as the ability to read or to repair a small motor, are easily generalized to and maintained in the natural environment, the preceding discussion has emphasized that it would be unreasonable to expect that other skills, such as employability and interpersonal skills, will generalize to and be maintained in the natural environment unless there is a programmed transitional effort to both insure that this will occur and to teach additional community-living skills that cannot be approximated in the institution setting. Institutions, through prosthetic programming and intensified training, can remediate deficiencies and expand skill repertoires, thereby providing the released offender with more options than he possessed prior to his imprisonment. There is little, if anything, those in the institution can do to guarantee that the contingencies of the natural environment will either permit or encourage the offender to exercise these options following his release. Clearly, an applied behavior analysis approach to the development of continuity in care and rehabilitation will prove to be as critical for the success of programming within each division of the criminal justice system as it has been in the education and mental health professions.

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